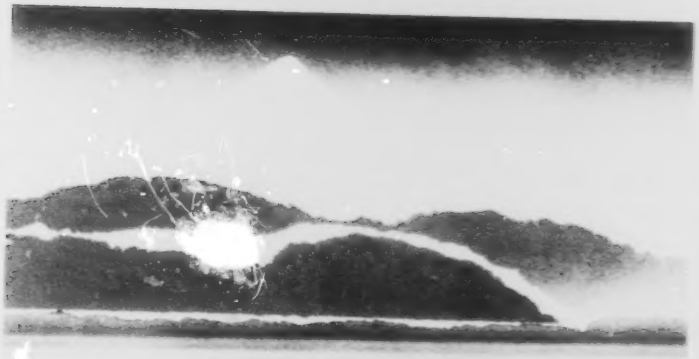
METAL CONCENTRATIONS IN FISH TISSUE FROM UNCONTAMINATED B.C. LAKES



BC Environment
Water Management Division

MINISTRY OF ENVIRONMENT, LANDS AND PARKS

PROVINCE OF BRITISH COLUMBIA

METAL CONCENTRATIONS IN FISH TISSUE FROM UNCONTAMINATED B.C. LAKES

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WATER QUALITY SECTION

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AUGUST, 1992

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Canadian Cataloguing in Publication Data
Rieberger, Kevin.
Metal concentrations in fish tissue from uncontaminated B.C. lakes

Includes bibliographical references: p.
ISBN 0-7726-1657-4

1. Fishes - British Columbia - Effect of heavy metals on. 2. Fishes - British Columbia - Effect of water pollution on. 3. Heavy metals - Physiological effect. I. BC Environment. Water Quality Branch. II. Title.

SH177.H4R52 1992 597'.01921 C92-092366-6

ABSTRACT

Metal concentrations were measured in the muscle and liver tissue of fish captured in 54 British Columbia lakes considered relatively unaffected by human pollution. The metals tested for were Al, As, Ba, Be, Ca, Cd, Cu, Fe, Hg, Mn, Ni, P, Pb and Zn. Mean concentrations were calculated by species, tissue type, lake, biogeoclimatic zone, and tectonic region. Mercury was the only metal to show evidence of bioaccumulation, although the results may be suspect because of sampling techniques. The highest levels of Pb in muscle tissue were found in mountain whitefish (0.46 µg/g wet-weight) and were below the upper limit recommended for human consumption (0.8 µg/g wet-weight). Cutthroat trout had the highest level of Hg in muscle tissue (0.29 µg/g wet-weight) and this too was below the upper limit recommended for human consumption (0.5 µg/g wet-weight). The mean values reported for each species may be useful as indicators of metal concentrations in tissue of fish from lakes considered unaffected by human presence.

ACKNOWLEDGEMENTS

The author would like to thank Les Swain, Dr. Rick Nordin, and Roland Rocchini for guidance and critical review of the manuscript. Thanks are also extended to Colin McKean and Ron Hall for assistance with data manipulation and statistical analyses. The samples from which the data in this report were generated were collected by the Fisheries Inventory Unit of the Fisheries Branch of the B.C. Ministry of Environment, Lands, and Parks, under the direction of Mr. John Balkwill.

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1.0 INTRODUCTION

The effects of heavy metals on freshwater ecosystems have been investigated by examining a number of organisms including fish (Dixon and Sprague, 1981; Wren *et al.*, 1983), invertebrates (Salanki and V.-Balogh, 1989), plankton (Marshall *et al.*, 1983; Kerrison *et al.*, 1988) and macrophytes (Mayes *et al.*, 1977). Fish have been widely studied because of their economic and recreational value. In many cases, however, metal concentrations in fish tissue have not been investigated until the deleterious effects become noticeable. In British Columbia, studies have been conducted in the Buttle Lake watershed where acid mine drainage resulted in elevated levels of zinc, copper, cadmium and lead (Deniseger *et al.*, 1988). Singleton (1983) reported on metal concentrations in muscle and liver tissue from fish throughout the Fraser River, noting a number of differences between results from the upper, natural reaches and the lower, developed reaches.

In uncontaminated, natural environments the heavy metal concentrations in water and living organisms depend on the geochemical background (Salanki *et al.*, 1982). This report summarizes data from 54 uncontaminated lakes throughout B.C. and presents muscle and liver concentrations based on species, biogeoclimatic zone, tectonic region and individual lake. The intent is to provide baseline data for fish which can be compared to fish collected from other similar lakes as well as those lakes that may be contaminated.

2.0. METHODS

2.1 Fish Collection

Fish were collected from 54 lakes (Figure 1) by Ministry of Environment fisheries staff between 1982 and 1987 as part of their lake survey work and compilation of baseline data. These data included bathymetric data (Balkwill, 1991), water chemistry (Swain, 1987), sediment chemistry (Rieberger, 1992), and fish muscle and liver analyses. Data for fish muscle and liver analyses were categorized by species, tissue type, lake, biogeoclimatic zone (Farley, 1979), and tectonic region (Farley, 1979). British Columbia can be divided into six physiographic units, based on tectonic processes and geological evolution. In many instances the boundaries of these tectonic regions are marked by major fault lines (Farley, 1979).

Fish species collected included rainbow trout (*Oncorhynchus mykis*), cutthroat trout (*O. clarki*), kokanee and sockeye salmon (*O. nerka*), coho salmon (*O. kisutch*), Dolly Varden char (*Salvelinus malma*), lake trout (*S. namaycush*), arctic grayling (*Thymallus arcticus*), mountain whitefish (*Prosopium williamsoni*), lake whitefish (*Coregonus clupeaformis*), northern pike (*Esox lucius*) and burbot (*Lota lota*). Up to five individuals per species were collected from each lake. Fish were captured using gill nets with mesh size ranging from 3.8 cm to 16.5 cm. Tissue samples, weights, lengths, scale samples, and otoliths were collected in the field. Muscle tissue and scale samples were taken from the preferred area below and posterior to

Figure 1: Locations of lakes sampled. Dots represent the location of one or more lakes sampled in the same proximity.

the dorsal fin. Once removed, muscle tissue and livers were placed in polyethylene cups and frozen until shipment to the laboratory.

2.2 Tissue Analysis

Tissue samples were analyzed for Al, As, Ba, Be, Ca, Cu, Cd, Fe, Hg, Mn, Ni, P, Pb, Zn and percent moisture. Analyses were performed by the B.C. Ministry of Environment Laboratory in Vancouver, B.C.; this laboratory has since been privatized. Details of the methods are listed in McQuaker (1989).

Tissue samples were homogenized in a mixture of nitric acid and perchloric acid. Mercury levels were determined by cold vapor atomic absorption spectrophotometry. Lead levels were determined by hydride generation atomic absorption spectrophotometry. All other metal levels were determined by inductively coupled plasma emission spectrometry. Moisture content was determined gravimetrically following homogenization and drying at 105 °C.

Detection limits were set at 1.0 µg/g dry-weight for all metals except As (0.1 µg/g dry-weight), Hg (0.01 µg/g dry-weight), Al (2 µg/g dry-weight) and Ni (5 µg/g dry-weight). Liver samples were analyzed as individual livers or as composite samples. Composites were a combination of individual livers from the same species in a given lake, which were pooled and analyzed as a single liver sample. Analysis of composites was used when livers from a particular species in a given lake showed Hg levels below the detection limit.

The composite samples were analyzed for all metals as well as percent moisture. In the statistical analysis of the data, composite samples were treated as individual liver samples.

2.3 Data Analysis

Metal concentrations, reported by the lab on a dry-weight basis, were first converted to µg/g wet-weight using the moisture content of the individual fish. The data were sorted according to species and tissue type, and grand mean concentrations were then calculated for all lakes. Mean concentrations were also calculated according to biogeoclimatic zone and tectonic region. It should be noted that values lower than the detection limits were arbitrarily recorded as the detection limit. All mean metal concentrations which used values recorded as detection limits will be skewed and therefore somewhat higher than the true mean. If the sample size for a particular observation was 20 or greater, it was tested for normality and used in further analysis. Failing to show evidence of normality, the data were ranked and the following hypotheses were tested using the Wilcoxon Rank Sum Test:

i) H_o: Cutthroat [metal] = rainbow [metal] (muscle and liver)

ii) H_o: Dolly Varden [metal] = lake trout [metal] (muscle).

These hypotheses were based on genus, that is, testing for differences between metal concentrations in two species belonging to the genus *Onchorhynchus* and between two species belonging to

genus *Salvelinus*. A third hypothesis, H_o: arctic grayling [metal] = mountain whitefish [metal], was also tested because of similarities in both the biogeoclimatic zones and tectonic regions in which the two species are found. The Wilcoxon Rank Sum Test allows for comparison of two independent groups which do not come from a normal distribution. The actual measurements are not used but rather the ranks of those measurements in either ascending of descending order. The Wilcoxon Rank Sum Test is an analogue to the more common two-sample *t*-test (Zar, 1984).

Least squares regression and logarithmic regression were used to determine the occurrence of bioaccumulation of metals in muscle tissue and livers. Data points were plotted and visually inspected. If it appeared that a straight line analysis was not appropriate, logarithmic regression was used. Sample sizes of 20 or more were used to test weight against length to confirm this relationship. Metal concentrations were then tested as a function of both weight and length. The Kruskil-Wallis Test was used to compare mean metal concentrations within species occurring in different biogeoclimatic zones and tectonic regions. Mean values were also calculated by lake. All tests, except logarithmic regression, were done using the SAS system for statistical analysis at the 95% significance level. Logarithmic regression analysis was performed using the Cricket Graph software package (Cricket Software, Malvern, PA).

3.0 RESULTS AND DISCUSSION

3.1 Metal Concentration By Species

The total number of tissue samples taken from the 54 lakes throughout B.C. is listed by species in Table 1. The rainbow trout and lake trout data contain two and four livers, respectively, which were not tested for metal concentrations; therefore the liver sample totals listed in Table 1 do not agree with those listed in Tables 2b and 2d, which give mean metal concentrations in tissues of rainbow trout and lake trout, respectively.

Table 1: Number of tissue samples taken for metal analysis.

Species	Liver	Muscle	Composite
Arctic grayling	12	22	1
Burbot	1	0	0
Coho	3	3	0
Cutthroat	65	54	11
Dolly Varden	45	51	5
Kokanee	5	4	0
Lake trout	20	25	3
Lake whitefish	9	15	1
Mtn. whitefish	20	20	4
Pike	5	5	1
Rainbow	99	115	16
Sockeye	5	5	1

Mean metal concentrations are listed by species and tissue type in Tables 2a to 2f ($n \geq 20$) and Appendix 1 ($n \leq 20$).

Table 2a: Mean metal concentrations (µg/g wet-weight) by tissue for cutthroat trout. Liver tissues were collected from 13 lakes and muscle tissues were collected from 11 lakes.

Metal	Liver	Std. Dev.	n	Muscle	Std. Dev.	n
Al	2.56	3.36	75	1.06	1.56	54
As	0.03	0.03	76	0.02	0.00	54
Ba	0.29	0.22	75	0.22	0.02	54
Be	0.28	0.21	75	0.22	0.02	54
Ca	61.3	20.7	75	353	348	54
Cd	0.29	0.22	75	0.22	0.02	54
Cu	19.4	26.7	75	0.30	0.14	54
Fe	200	141	75	4.33	2.77	54
Hg	0.35	0.25	13	0.29	0.25	50
Mn	1.35	0.38	75	0.29	0.17	54
Ni	1.48	1.08	75	1.12	0.10	54
P	2800	656	75	2344	291	53
Pb	0.39	0.33	76	0.26	0.10	52
Zn	23.7	5.99	75	3.55	0.64	54

Table 2b: Mean metal concentrations (µg/g wet-weight) by tissue for rainbow trout. Liver and muscle tissues were collected from 24 lakes.

Metal	Liver	Std. Dev.	n	Muscle	Std. Dev.	n
Al	2.15	2.67	110	1.24	1.55	112
As	0.18	0.63	98	0.15	0.52	100
Ba	0.32	0.22	110	0.24	0.07	112
Be	0.31	0.21	110	0.23	0.03	112
Ca	82.3	81.7	110	378	597	112
Cd	0.31	0.22	110	0.23	0.03	112
Cu	51.1	46.8	110	0.39	0.29	112
Fe	318	213	110	7.50	7.76	111
Hg	0.11	0.10	17	0.09	0.05	97
Mn	1.57	1.19	110	0.27	0.13	107
Ni	1.60	1.05	110	1.20	0.40	112
P	3051	922	110	2424	449	112
Pb	0.74	1.88	113	0.41	0.52	115
Zn	28.8	16.8	110	4.28	1.35	112

Table 2c: Mean metal concentrations (µg/g wet-weight) by tissue for Dolly Varden char. Liver tissues were collected from 10 lakes and muscle tissues were collected from 12 lakes.

Metal	Liver	Std. Dev.	n	Muscle	Std. Dev.	n
Al	2.03	1.83	49	0.76	0.70	51
As	0.03	0.01	40	0.03	0.03	36
Ba	0.26	0.12	49	0.23	0.05	51
Be	0.26	0.12	49	0.23	0.05	51
Ca	63.6	44.8	49	227	200	51
Cd	0.27	0.13	49	0.23	0.05	51
Cu	14.4	18.8	49	0.38	0.20	51
Fe	216	136	49	5.66	3.55	51
Hg	0.11	0.12	9	0.15	0.22	46
Mn	1.55	0.79	49	0.33	0.24	51
Ni	1.32	0.62	49	1.14	0.22	51
P	2819	656	49	2343	462	51
Pb	0.33	0.21	50	0.27	0.12	51
Zn	30.2	7.19	49	3.78	0.79	51

Table 2d: Mean metal concentrations (µg/g wet-weight) by tissue for lake trout. Liver tissues from four lakes and muscle tissues were collected from five lakes.

Metal	Liver	Std. Dev.	n	Muscle	Std. Dev.	n
Al	2.20	3.51	19	0.84	0.81	25
As	0.03	0.01	19	0.02	0.00	20
Ba	0.28	0.09	19	0.25	0.08	25
Be	0.28	0.09	19	0.23	0.04	25
Ca	60.6	25.8	19	342	302	25
Cd	0.28	0.09	19	0.23	0.04	25
Cu	13.6	6.71	19	0.27	0.16	25
Fe	382	237	19	5.58	2.95	25
Hg	0.09	0.04	3	0.26	0.26	25
Mn	1.19	0.47	19	0.24	0.07	25
Ni	1.41	0.46	19	1.16	0.19	25
P	2696	527	19	2180	346	25
Pb	0.30	0.12	19	0.24	0.06	25
Zn	28.0	2.87	19	3.07	0.92	25

Table 2e: Mean metal concentrations (µg/g wet-weight) by tissue for arctic grayling. Liver tissues were collected from three lakes and muscle tissues were collected from five lakes.

Metal	Liver	Std. Dev.	n	Muscle	Std. Dev.	n
Al	1.49	1.76	13	0.56	0.25	22
As	0.02	0.00	6	0.02	0.00	5
Ba	0.22	0.04	13	0.24	0.13	22
Be	0.22	0.04	13	0.20	0.02	22
Ca	109	54.9	13	312	359	22
Cd	0.24	0.09	13	0.20	0.02	22
Cu	5.00	3.10	13	0.45	0.44	22
Fe	83.5	42.6	13	5.62	2.63	22
Hg	0.08	0.0	1	0.08	0.04	21
Mn	1.76	0.45	13	0.21	0.05	22
Ni	1.12	0.21	13	1.02	0.10	22
P	2781	375	13	1987	440	22
Pb	0.28	0.17	13	0.46	1.13	22
Zn	24.5	5.85	13	6.05	2.79	22

Table 2f: Mean metal concentrations (µg/g wet-weight) by tissue for mountain whitefish. Liver tissues and muscle tissues were collected from four lakes.

Metal	Liver	Std. Dev.	n	Muscle	Std. Dev.	n
Al	1.83	1.63	24	1.46	1.48	20
As	0.02	0.01	24	0.02	0.00	20
Ba	0.26	0.08	24	0.33	0.27	20
Be	0.25	0.06	24	0.24	0.03	20
Ca	100	76.2	24	668	701	20
Cd	0.25	0.06	24	0.24	0.03	20
Cu	3.62	7.70	24	0.35	0.20	20
Fe	95.7	68.4	24	7.17	3.76	20
Hg	0.12	0.02	3	0.11	0.09	15
Mn	1.77	0.60	24	0.32	0.16	20
Ni	1.24	0.26	24	1.21	0.17	20
P	3354	517	24	2537	451	20
Pb	0.38	0..31	24	0.27	0.10	20
Zn	23.3	4.48	24	4.16	1.00	20

In analyzing these results it was noted that Ca was the only metal which showed consistently higher mean concentrations in muscle tissue than in liver tissue. This high concentration can be expected because Ca is physiologically required in muscle contraction. Lake trout muscle tissue had a higher mean concentration of Hg (0.26 µg/g) than liver tissue (0.09 µg/g); however, the sample size for liver Hg analysis was only three and this value may not provide an accurate estimate of the mean. Mountain whitefish muscle tissue showed higher mean values for Ba (0.33 µg/g) than liver tissue (0.26 µg/g) but these values were not significantly different ($P > 0.5$) at the 95% significance level.

3.1.1 Liver tissue

For liver tissue samples (with $n \geq 20$), rainbow trout had the highest mean concentrations for As (0.18 µg/g), Ba (0.32 µg/g), Be (0.31 µg/g), Cd (0.31 µg/g), Cu (51.1 µg/g), Fe (318 µg/g), Ni (1.60 µg/g) and Pb (0.74 µg/g). Mountain whitefish had the highest mean values for Ca (100 µg/g), Mn (1.77 µg/g) and P (3354 µg/g). Lake trout had the highest mean concentrations for Fe (382 µg/g), while cutthroat trout had the highest values for Al (2.56 µg/g) and Hg (0.35 µg/g with $n = 13$).

Singleton (1983) reported metal concentrations in the liver tissue of Dolly Varden char from the upper reaches of the Fraser

River, where fish are under minimal influence from humans. These values are listed in Table 3 and are very similar to the data reported here for Dolly Varden char liver tissue ($n \geq 20$). This suggests that the reported values may be appropriate as indicators of liver metal concentrations from fish in an unaffected habitat.

Table 3: Heavy metal concentrations (µg/g wet-weight) in liver tissue of Dolly Varden char from the upper Fraser River (Singleton, 1983). Site 7 was located approximately 25 km downstream from McBride and Site 8 was located approximately 100 km upstream from McBride.

Site	n	As	Cd	Cu	Fe	Pb	Mn	Hg	Zn
7	8	<0.44	<0.22	5.35	176	<0.22	1.11	0.07	30.5
8	2	<0.58	<0.23	20.4	175	<0.29	0.58	0.05	30.8

Deniseger *et al.*(1988) reported heavy metal concentrations in the tissue of fish from Buttle Lake, a lake which was subject to increased loadings of Cu, Cd, and Zn due to acid mine drainage during the 1960's and 1970's. These data (Table 4) were used for comparison to the reported values from unaffected lakes. The Buttle Lake data were reported as µg/g dry-weight. In order to compare data, an 80% moisture content was assumed and the values were converted to wet-weight. This comparison illustrates the differences in tissue metal concentrations between fish from a relatively unaffected habitat and those from a contaminated habitat. Rainbow trout appear to be more prone to having elevated metal

concentrations than cutthroat trout, especially in liver tissue. The high levels of hepatic Cu, relative to Zn and Cd, can be attributed to the high binding capacity of Cu to hepatic thioneins (Roch and McCarter, 1984). Cutthroat trout liver Zn levels are quite similar in both data sets, while rainbow trout liver Zn levels are noticeably higher in the Buttle Lake data. The similarity in cutthroat Zn levels may be related to diet; it is possible that cutthroat prey items do not accumulate Zn as quickly as rainbow prey items. The difference in results may also be related to intraspecific differences in the binding capacity of Zn in rainbow and cutthroat trout livers.

3.1.2 Muscle tissue

Inspection of metal concentrations in muscle tissue showed mountain whitefish to have the highest mean concentrations of Al (1.46 µg/g), Ba (0.33 µg/g), Be (0.24 µg/g), Ca (668 µg/g), Cd (0.24 µg/g), Ni (1.21 µg/g) and P (2537 µg/g). It has also been shown that mountain whitefish muscle and liver tissues may have a higher ability to accumulate dioxins and furans, compared to other fish species present (Dwernychuk *et al.*, 1991). Mountain whitefish are primarily bottom feeders (Scott and Crossman, 1973) and the increased metal and organochlorine concentrations may be a reflection of elevated levels of exposure to sediment accumulations by mountain whitefish benthic prey items.

Arctic grayling had the highest mean concentrations of Cu (0.45 µg/g), Pb (0.46 µg/g) and Zn 6.05 (µg/g). Dolly Varden char had the highest mean values for As (0.03 µg/g) and Mn (0.33 µg/g), rainbow trout had the highest value for Fe (7.50 µg/g), and cutthroat trout had the highest value for Hg (0.29 µg/g).

Table 4: Heavy metal concentration (µg/g wet-weight) in fish tissue from Buttle Lake (1979-81). Mean values presented in Tables 2a, 2b, and 2c of this report follow in parentheses.

		Rainbow		Cutthroat		Dolly Varden	
Zn	Liver	33.6	(28.8)	23.4	(23.7)		
	Muscle	7.56	(4.28)	4.86	(3.55)	7.84	(3.78)
Cu	Liver	107	(51.1)	34.0	(19.4)		
	Muscle	0.42	(0.39)	0.43	(0.30)		
Cd	Liver	3.88	(0.31)	1.50	(0.29)		

Levels of Zn and Cu were higher in both the cutthroat and rainbow trout muscle tissue collected in Buttle Lake.

The mountain whitefish Pb concentration reported here (0.46 µg/g) is well below the alert level for human consumption of 0.8 µg/g (Nagpal, 1987). Cutthroat Hg concentrations (0.29 µg/g wet-weight) in muscle tissue were also below the maximum limit of 0.5 µg/g wet-weight recommended for the average fish consumer (Nagpal, 1989). The concentrations in muscle tissue for Dolly Varden char and rainbow trout in the upper Fraser River (Singleton,

1983) are similar to the values reported here. This observation, like that for liver, suggests that these data are suitable as indicators of typical levels for muscle tissue in fish from a relatively unaffected habitat.

It should be noted that both the liver and muscle Hg concentrations reported here may be unreliable and should be referred to with caution. Sampling conditions were not ideal and samples were stored in polyethylene cups instead of the more recently recommended teflon bottles (Brooks Rand, Ltd., 1990) which prevent the diffusion of Hg from the air or other samples. As a result, the values reported here may be higher than the values obtained using other methods.

3.2 Inter-species Comparison of Metal Concentrations

Testing for normality showed that the majority of parameters (93.7%) tested among the various species did not come from a normally distributed population. Those tests that did show evidence of a normal distribution are listed in Appendix 2. Normally distributed results were found in three different species (cutthroat trout, lake trout and mountain whitefish). Because the majority of parameters within a species were not normally distributed, all data were treated as if they were not normally distributed.

The results of the Wilcoxon Rank Sum tests are listed in Appendix 3. Dolly Varden char and lake trout muscle tissue appeared to have similar metal levels and thus showed no significant difference in any of the metal concentrations except Cu and Zn. Mean weight and length were, however, significantly different. Cutthroat and rainbow trout samples showed no significant difference in mean weight or length values which may imply that weight and length are not responsible for differences in metal concentrations in muscle tissue between these two species. Liver tissue from cutthroat and rainbow trout showed no significant difference in concentrations of Ba, Mn, Ni and Pb, while muscle tissue showed no significant difference in concentrations of Al, Ca, Mn, Ni and P. There was evidence of significant differences for the other metal concentrations. Arctic grayling and mountain whitefish muscle tissue showed similarities in only Fe, Hg and Mn concentrations.

The results of this analysis suggest that Dolly Varden char and lake trout data may be pooled together as char and used as an indicator of metal concentrations. This may be useful in situations where only low sample sizes of either species are available for analysis. However, cutthroat trout, rainbow trout, arctic grayling and mountain whitefish should be analyzed as separate species.

3.3 Regression Analysis

The results of least squares and logarithmic regression analysis

which a significant (R^2 > 0.2) relationship existed between metal concentration and fish weight or length, are listed in Tables 5a and 5b, respectively and illustrated in Appendix 4. For this test a minimum sample size of 10 was used. All regressions involving Hg showed a positive slope and included:

1.) [Hg] in cutthroat muscle tissue as a function of fish weight and length

2.) [Hg] in mountain whitefish muscle tissue as a function of fish weight and length and

3.) [Hg] in lake trout muscle tissue as a function of length.

Other studies (Wren *et al.*, 1983; Wren and MacCrimmon, 1986) have also demonstrated this relationship between muscle Hg concentration and fish length. These data must be viewed carefully because of the sampling techniques used and the possibility of geological influence. The possibility of the bioaccumulation and biomagnification of Hg in three different species does suggest that further sampling may be warranted.

Phosphorus concentration in lake trout muscle tissue as a function of length also showed a positive slope. This may be related to physiological processes within the fish and may vary among species. All other regressions (with R^2 > 0.2) showed negative slopes. This may indicate that bioaccumulation is not significant for metals other than Hg, as suggested by Wren *et al.*(1983).

Table 5a: Results of least squares regression analysis of mean metal concentration as a function of fish weight.

Species	Metal	Tissue	R^2	n
Cutthroat	Hg	Muscle	0.62	49
Cutthroat	Zn	Liver	0.32 *	63
Lake trout	Fe	Liver	0.40	10
Lake trout	Mn	Liver	0.39	10
Lake trout	P	Liver	0.27	10
Lake trout	Zn	Liver	0.21	10
Lake trout	P	Muscle	0.58	19
Lake trout	Ca	Muscle	0.31	19
Mtn. whitefish	Hg	Muscle	0.34	14
Mtn. whitefish	P	Muscle	0.29	19

* = logarithmic regression

Table 5b: Results of least squares regression analysis of mean metal concentration as a function of fish length.

Species	Metal	Tissue	R^2	n
Cutthroat	Hg	Muscle	0.60	49
Cutthroat	Fe	Muscle	0.21	53
Cutthroat	Zn	Muscle	0.36	53
Dolly Varden	As	Liver	0.21	34
Dolly Varden	Cd	Liver	0.30 *	43
Dolly Varden	Ni	Liver	0.32 *	43
Lake trout	As	Muscle	0.42	14
Lake trout	Ca	Muscle	0.28	19
Lake trout	Fe	Muscle	0.20	19
Lake trout	Hg	Muscle	0.30	19
Lake trout	P	Muscle	0.73	19
Mtn. whitefish	Hg	Muscle	0.27	14
Mtn. whitefish	P	Muscle	0.24	19
Rainbow	Cd	Liver	0.41 *	83
Rainbow	Ni	Liver	0.44 *	83

* = logarithmic regression

Logarithmic regression was used to analyze Zn concentrations in cutthroat trout muscle tissue as a function of weight. The logarithmic relationship illustrated by these data suggests that Zn concentrations decrease with increasing fish weight but not as quickly as other metals which showed a linear relationship. This may be caused by the rate of Zn accumulation being much less than the growth rate of juvenile fish. As the growth rate of mature fish diminishes an equilibrium between Zn accumulation and growth may be reached.

Logarithmic regression was also used to analyze Cd and Ni concentrations in rainbow trout and Dolly Varden char liver tissue as a function of length. A negative logistic curve was seen in the rainbow trout data, but this can be explained by a high number of data points below the detection levels which were recorded as the absolute values of the detection limits (5 µg/g wet-weight for Ni and 1 µg/g wet-weight for Cd) in the statistical analysis. A linear relationship likely would have been seen with lower detection levels for these two metals. The negative trend in the Dolly Varden char data was likely caused by outlying data points in two of the livers tested (see Figures 7 and 8, Appendix 4). Regressions with R^2 values < 0.2 may indicate that the observed metal concentration is independent of size. Some regression analyses resulted in R^2 values greater than 0.2 because of outlying points (see Figures 6, 7, 8, 20, and 22, Appendix 4) and these are not considered as evidence of a relationship between fish size and metal concentration in fish tissue.

3.4 Regional Analysis

The results of Kruskal-Wallis tests on mean metal concentrations between species and biogeoclimatic zones or tectonic regions are listed in Appendices 5 and 6, respectively. Metal concentrations in both liver and muscle tissue were generally different between biogeoclimatic zones for all species. Exceptions to this were cutthroat liver concentrations which showed 71% of metals tested had similar concentrations between biogeoclimatic zones in which they were found and lake trout muscle metal concentrations which showed 57% similarity.

In comparing mean metal concentrations to tectonic regions, similarities were found in lake trout liver metal concentrations (86%), rainbow liver metal concentrations (57%), and Dolly Varden char liver metal concentrations (57%). Mean values are also listed by lake, species and tissue type in Appendix 7.

4.0 CONCLUSIONS

The mean values listed in Tables 2a to 2f, for six different fish species, may be useful as indicators of metal concentrations in fish tissue from uncontaminated lakes in B.C. The values for muscle and liver tissue from cutthroat trout, rainbow trout and Dolly Varden char may be the best indicators because of the large sample sizes ($n \geq 49$).

Dolly Varden char and lake trout metal concentrations were very similar and it may be possible to pool data from each species for analysis when data are limited. In most cases sample sizes based on biogeoclimatic zone, tectonic region, and individual lakes were small and therefore statistical results were not considered valid. Data from relatively unaffected lakes in B.C., however, are limited and the results reported here, independent of sample size, are included as a basis for comparison in future work.

Mercury was the only metal showing evidence of bioaccumulation. The results must be used with caution, however, because of the sampling techniques used. The observed trends suggest that further data collection may be warranted.

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Appendix 1

Mean Metal Concentrations in
Fish Liver and Muscle Tissue
($n < 20$)

Units of Measurement:
- Weight: grams
- Length: centimetres
- Moisture: percent (%)
- Metal Concentration: µg/g wet-weight

Artic grayling: liver tissue

Variable	N	Mean	Std Dev
LENGTH	12	37.77	3.80
WEIGHT	12	604.17	168.83
MOISTURE	13	0.78	0.04
AL	13	1.49	1.76
AS	6	0.02	0.00
BA	13	0.22	0.04
BE	13	0.22	0.04
CA	13	109.44	54.92
CD	13	0.24	0.09
CU	13	5.00	3.10
FE	13	83.51	42.61
HG	1	0.08	
MN	13	1.76	0.45
NI	13	1.12	0.21
PB	13	0.28	0.17
ZN	13	24.52	5.85
P	13	2781.71	375.47

Burbot: liver tissue

Variable	N	Mean	Std Dev
LENGTH	1	54.80	
WEIGHT	1	900.00	
MOISTURE	1	0.72	
AL	1	0.56	
AS	1	0.08	
BA	1	0.28	
BE	1	0.28	
CA	1	25.02	
CD	1	0.28	
CU	1	3.89	
FE	1	94.24	
HG	0		
MN	1	0.56	
NI	1	1.39	
PB	1	0.28	
ZN	1	18.35	
P	1	1946.00	

Coho: liver tissue

Variable	N	Mean	Std Dev
LENGTH	3	19.27	3.52
WEIGHT	3	85.00	51.96
MOISTURE	3	0.77	0.03
AL	3	3.58	2.05
AS	3	0.02	0.00
BA	3	0.23	0.03
BE	3	0.23	0.03
CA	3	84.99	18.81
CD	3	0.23	0.03
CU	3	6.84	3.11
FE	3	420.36	171.27
HG	0		
MN	3	3.71	3.11
NI	3	1.16	0.16
PB	3	0.65	0.43
ZN	3	34.64	9.05
P	3	2788.13	128.56

Coho: muscle tissue

Variable	N	Mean	Std Dev
LENGTH	3	19.27	3.52
WEIGHT	3	85.00	51.96
MOISTURE	3	0.80	0.00
AL	3	1.02	0.34
AS	3	0.02	0.00
BA	3	0.21	0.00
BE	3	0.21	0.00
CA	3	227.24	103.02
CD	3	0.21	0.00
CU	3	0.34	0.12
FE	3	5.52	2.25
HG	0		
MN	3	0.34	0.12
NI	3	1.03	0.01
PB	3	0.27	0.12
ZN	3	3.55	0.49
P	3	2213.30	127.34

Kokanee: liver tissue

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	5	0.80	0.03
AL	5	0.55	0.12
AS	5	0.02	0.00
BA	5	0.20	0.03
BE	5	0.20	0.03
CA	5	53.72	29.00
CD	5	0.20	0.03
CU	5	33.60	42.76
FE	5	292.45	296.72
HG	0		
MN	5	1.14	0.26
NI	5	1.01	0.15
PB	5	0.20	0.03
ZN	5	22.25	3.86
P	5	3363.36	971.32

Kokanee: muscle tissue

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	4	0.74	0.05
AL	4	0.57	0.11
AS	4	0.05	0.05
BA	4	0.26	0.05
BE	4	0.26	0.05
CA	4	185.11	71.77
CD	4	0.26	0.05
CU	4	0.31	0.10
FE	4	8.79	1.42
HG	4	0.08	0.01
MN	4	0.26	0.05
NI	4	1.34	0.22
PB	4	0.26	0.05
ZN	4	3.51	0.15
P	4	2121.19	156.14

Lake whitefish: liver tissue

Variable	N	Mean	Std Dev
LENGTH	9	32.74	3.40
WEIGHT	9	375.56	135.08
MOISTURE	10	0.79	0.03
AL	10	6.20	9.98
AS	10	0.04	0.03
BA	10	0.41	0.26
BE	10	0.41	0.26
CA	10	84.49	38.76
CD	10	0.41	0.26
CU	10	4.16	2.58
FE	10	138.86	108.11
HG	3	0.25	0.09
MN	10	1.73	0.33
NI	10	2.12	1.10
PB	10	0.49	0.34
ZN	10	24.85	4.75
P	10	2998.79	363.89

Lake whitefish: muscle tissue

Variable	N	Mean	Std Dev
LENGTH	14	33.29	2.82
WEIGHT	14	436.79	138.14
MOISTURE	15	0.80	0.03
AL	15	1.14	1.36
AS	10	0.02	0.01
BA	15	0.20	0.03
BE	15	0.20	0.03
CA	15	258.52	137.59
CD	15	0.20	0.03
CU	15	0.23	0.08
FE	15	6.55	7.05
HG	13	0.15	0.10
MN	15	0.26	0.13
NI	15	1.02	0.15
PB	15	0.36	0.41
ZN	15	7.04	8.47
P	15	2013.13	458.01

Pike: liver tissue

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	6	0.68	0.03
AL	6	1.19	0.53
AS	6	0.03	0.00
BA	6	0.32	0.03
BE	6	0.77	1.12
CA	6	49.01	32.04
CD	6	0.32	0.03
CU	6	63.72	28.27
FE	6	457.51	218.66
HG	1	0.05	
MN	6	1.40	0.33
NI	6	1.58	0.17
PB	6	0.32	0.03
ZN	6	51.65	9.64
P	6	2253.23	220.64

Pike: muscle tissue

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	5	0.78	0.00
AL	5	0.88	0.65
AS	5	0.02	0.00
BA	5	0.31	0.12
BE	5	0.22	0.00
CA	5	742.47	266.14
CD	5	0.22	0.00
CU	5	0.31	0.12
FE	5	4.93	0.69
HG	5	0.07	0.04
MN	5	0.92	0.19
NI	5	1.10	0.02
PB	5	0.26	0.10
ZN	5	5.01	0.22
P	5	2474.54	104.36

Sockeye: liver tissue

Variable	N	Mean	Std Dev
LENGTH	5	41.50	7.43
WEIGHT	5	835.00	405.28
MOISTURE	6	0.79	0.02
AL	6	0.80	0.59
AS	6	0.03	0.01
BA	6	0.25	0.09
BE	6	0.25	0.09
CA	6	48.67	7.58
CD	6	0.75	0.33
CU	6	204.28	120.26
FE	6	122.09	57.98
HG	6	0.06	0.01
MN	6	1.35	0.47
NI	6	1.26	0.45
PB	6	0.25	0.09
ZN	6	32.02	6.93
P	6	3047.53	461.16

Sockeye: muscle tissue

Variable	N	Mean	Std Dev
LENGTH	5	41.50	7.43
WEIGHT	5	835.00	405.28
MOISTURE	5	0.76	0.02
AL	5	0.49	0.04
AS	5	0.02	0.00
BA	5	0.24	0.02
BE	5	0.24	0.02
CA	5	353.88	546.05
CD	5	0.24	0.02
CU	5	0.24	0.02
FE	5	1.30	2.09
HG	4	0.05	0.00
MN	5	0.24	0.02
NI	5	1.21	0.10
PB	4	0.30	0.13
ZN	5	2.67	0.45
P	5	2190.00	549.33

Appendix 2

Samples Showing Evidence of a
Normal Distribution

Table 1: Samples showing evidence of coming from a normal distribution. Prob<W values indicate the probability of normal distribution. Metals were measured in µg/g wet-weight.

Species	Tissue	Parameter	n	Prob<W
Cutthroat	Liver	Mn	75	0.5515
Cutthroat	Muscle	P	53	0.7907
Cutthroat	Muscle	Zn	54	0.7969
Lake trout	Liver	Cu	19	0.7743
Lake trout	Liver	Hg	3	0.8426
Lake trout	Liver	Zn	19	0.6029
Mtn. whitefish	Liver	Hg	3	0.9916
Mtn. whitefish	Liver	Mg	24	0.5714
Mtn. whitefish	Liver	P	24	0.6382
Mtn. whitefish	Liver	Length (cm)	20	0.5151
Mtn. whitefish	Liver	Weight (g)	20	0.8319
Mtn. whitefish	Muscle	Length (cm)	20	0.5151
Mtn. whitefish	Muscle	Weight (g)	20	0.8319

Appendix 3

Results of Wilcoxon Rank Sum Tests Comparing Inter-species Metal Concentrations

Table 1: Results of Wilcoxon Rank Sum tests for H_o: cutthroat (Ct) liver variable = rainbow (Rbt) liver variable ($\alpha = 0.05$). If $P > |Z|$ is greater than 0.05 H_o is accepted. Metals are measured in µg/g wet-weight.

Variable	n	P > |Z|	Result
Length (cm)	Ct: 88 Rbt: 65	0.3766	accept H_o
Weight (g)	Ct: 88 Rbt: 65	0.2860	accept H_o
Al	Ct: 75 Rbt: 110	0.0207	reject H_o
As	Ct: 76 Rbt: 98	0.0957	accept H_o
Ba	Ct: 75 Rbt: 110	0.0710	accept H_o
Be	Ct: 75 Rbt: 110	0.0461	reject H_o
Ca	Ct: 75 Rbt: 110	0.0450	reject H_o
Cd	Ct: 75 Rbt: 110	0.0425	reject H_o
Cu	Ct: 75 Rbt: 110	0.0001	reject H_o
Fe	Ct: 75 Rbt: 110	0.0001	reject H_o
Hg	Ct: 13 Rbt: 17	0.0014	reject H_o
Mn	Ct: 75 Rbt: 110	0.6759	accept H_o
Ni	Ct: 75 Rbt: 110	0.2804	accept H_o
P	Ct: 75 Rbt: 110	0.0498	reject H_o
Pb	Ct: 76 Rbt: 113	0.6206	accept H_o
Zn	Ct: 75 Rbt: 110	0.0001	reject H_o

Table 2: Results of Wilcoxon Rank Sum tests for H_o: cutthroat (Ct) muscle variable = rainbow (Rbt) muscle variable ($\alpha = 0.05$). If $P > |Z|$ is greater than 0.05 H_o is accepted. Metals are measured in µg/g wet-weight.

Variable	n	P > |Z|	Result
Length (cm)	Ct: 54 Rbt: 104	0.5562	accept H_o
Weight (g)	Ct: 54 Rbt: 104	0.4326	accept H_o
Al	Ct: 54 Rbt: 112	0.1259	accept H_o
As	Ct: 54 Rbt: 100	0.0003	reject H_o
Ba	Ct: 54 Rbt: 112	0.0136	reject H_o
Be	Ct: 54 Rbt: 112	0.0295	reject H_o
Ca	Ct: 54 Rbt: 112	0.8917	accept H_o
Cd	Ct: 54 Rbt: 112	0.0295	reject H_o
Cu	Ct: 54 Rbt: 112	0.0249	reject H_o
Fe	Ct: 54 Rbt: 111	0.0030	reject H_o
Hg	Ct: 50 Rbt: 97	0.0001	reject H_o
Mn	Ct: 54 Rbt: 107	0.7243	accept H_o
Ni	Ct: 54 Rbt: 112	0.2191	accept H_o
P	Ct: 53 Rbt: 112	0.1061	accept H_o
Pb	Ct: 52 Rbt: 112	0.0881	accept H_o
Zn	Ct: 54 Rbt: 112	0.0003	reject H_o

Table 3: Results of Wilcoxon Rank Sum tests for H_o: arctic grayling (AG) muscle variable = mountain whitefish (MWF) muscle variable ($\alpha = 0.05$). If $P > |Z|$ is greater than 0.05 H_o is accepted. Metals are measured in µg/g wet-weight.

Variable	n	P > |Z|	Result
Length (cm)	AG: 22 MWF: 20	0.0001	reject H_o
Weight (g)	AG: 22 MWF: 20	0.0001	reject H_o
Al	AG: 22 MWF: 20	0.0009	reject H_o
As	AG: 5 MWF: 20	0.0828	accept H_o
Ba	AG: 22 MWF: 20	0.0027	reject H_o
Be	AG: 22 MWF: 20	0.0003	reject H_o
Ca	AG: 22 MWF: 20	0.0046	reject H_o
Cd	AG: 22 MWF: 20	0.0003	reject H_o
Cu	AG: 22 MWF: 20	0.7914	accept H_o
Fe	AG: 22 MWF: 20	0.2416	accept H_o
Hg	AG: 21 MWF: 15	0.0763	accept H_o
Mn	AG: 22 MWF: 20	0.0001	reject H_o
Ni	AG: 22 MWF: 20	0.0003	reject H_o
P	AG: 22 MWF: 20	0.0002	reject H_o
Pb	AG: 22 MWF: 20	0.0019	reject H_o
Zn	AG: 22 MWF: 20	0.0185	reject H_o

Table 4: Results of Wilcoxon Rank Sum tests for H_o: Dolly Varden char (DV) muscle variable = lake trout (LT) muscle variable (α = 0.05). If P > |Z| is greater than 0.05 H_o is accepted. Metals are measured in µg/gwet-weight.

Variable	n	P > |Z|	Result
Length (cm)	DV: 50 LT: 20	0.0001	reject H_o
Weight (g)	DV: 50 LT: 20	0.0001	reject H_o
Al	DV: 51 LT: 25	0.3734	accept H_o
As	DV: 36 LT: 20	0.9454	accept H_o
Ba	DV: 51 LT: 25	0.1326	accept H_o
Be	DV: 51 LT: 25	0.2389	accept H_o
Ca	DV: 51 LT: 25	0.1164	accept H_o
Cd	DV: 51 LT: 25	0.2389	accept H_o
Cu	DV: 50 LT: 20	0.0286	reject H_o
Fe	DV: 51 LT: 25	0.7401	accept H_o
Hg	DV: 46 LT: 25	0.0869	accept H_o
Mn	DV: 51 LT: 25	0.4757	accept H_o
Ni	DV: 51 LT: 25	0.2054	accept H_o
P	DV: 51 LT: 25	0.1065	accept H_o
Pb	DV: 51 LT: 25	0.7992	accept H_o
Zn	DV: 51 LT: 25	0.0001	reject H_o

Appendix 4

Graphical Representations of Regression Analysis

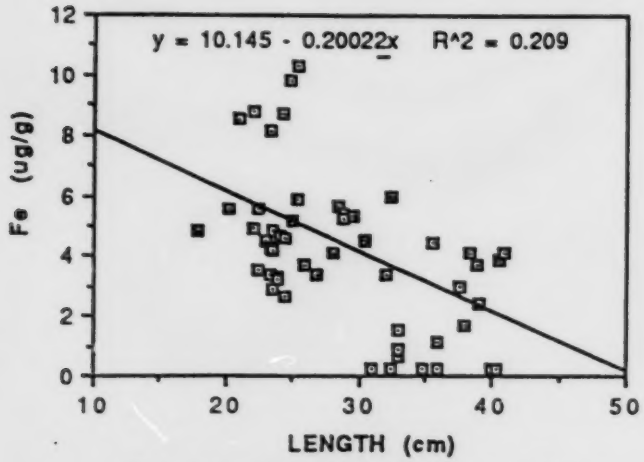

Figure 1: Iron concentration in cutthroat muscle tissue as a function of length.

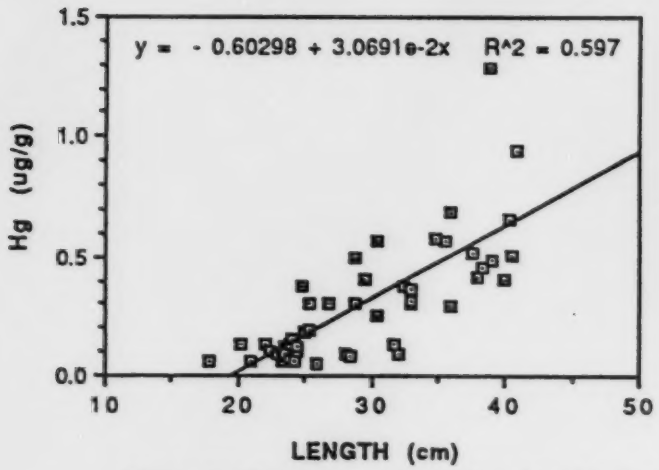

Figure 2: Mercury concentration in cutthroat muscle tissue as a function of length

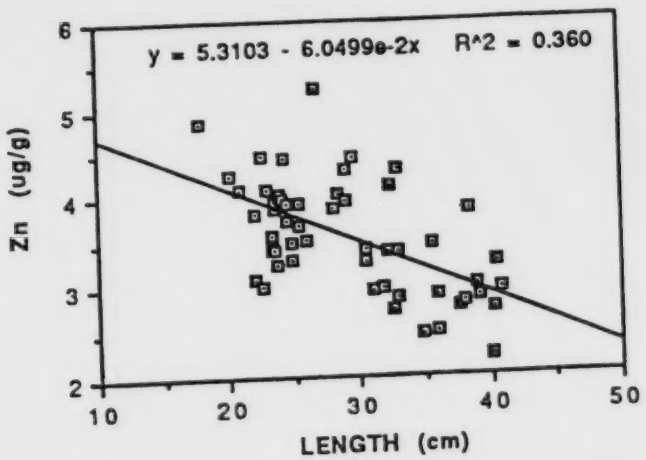

Figure 3: Zinc concentrations in cutthroat muscle tissue as a function of length.

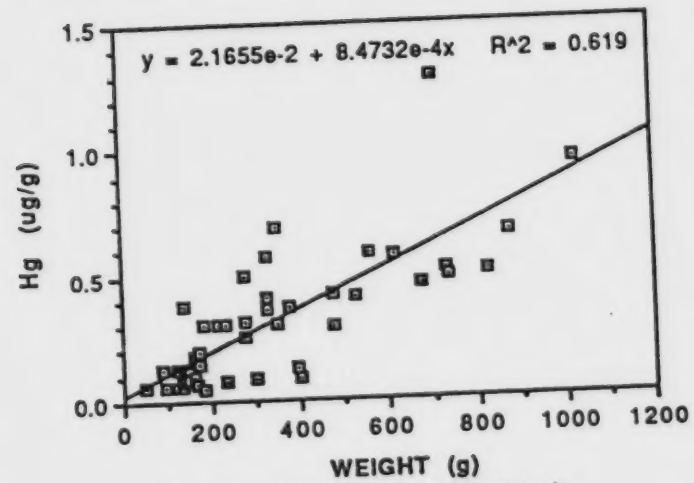

Figure 4: Mercury concentration in cutthroat muscle tissue as a function of weight.

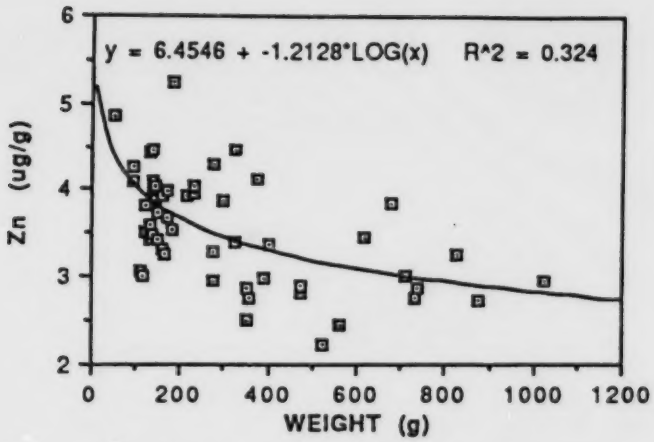

Figure 5: Zinc concentrations in cutthroat muscle tissue as a function of weight.

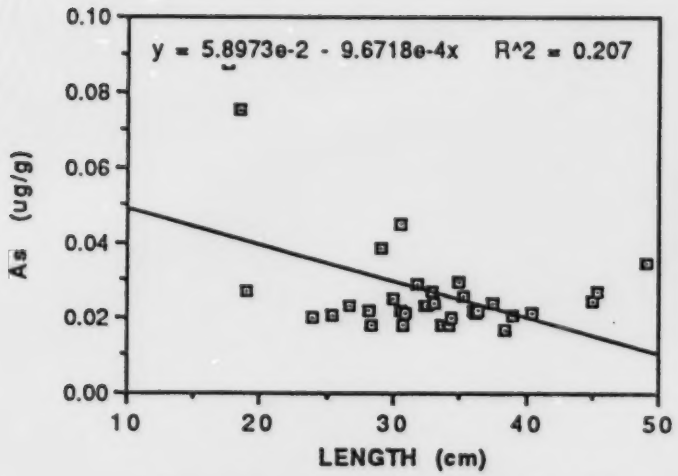

Figure 6: Arsenic concentration in Dolly Varden liver tissue as a function of length.

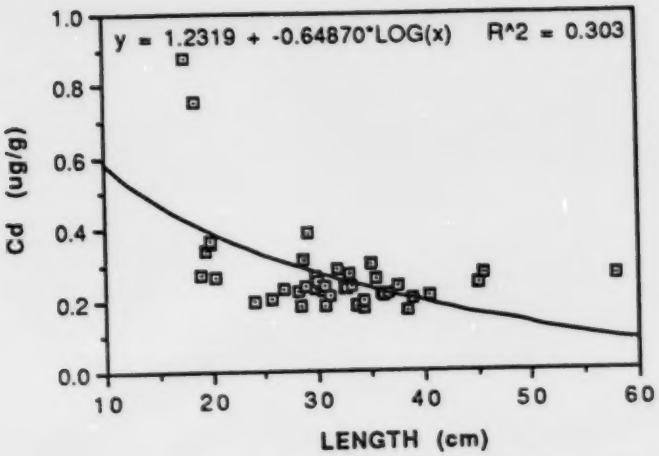

Figure 7: Cadmium concentration in Dolly Varden liver tissue as a function of length.

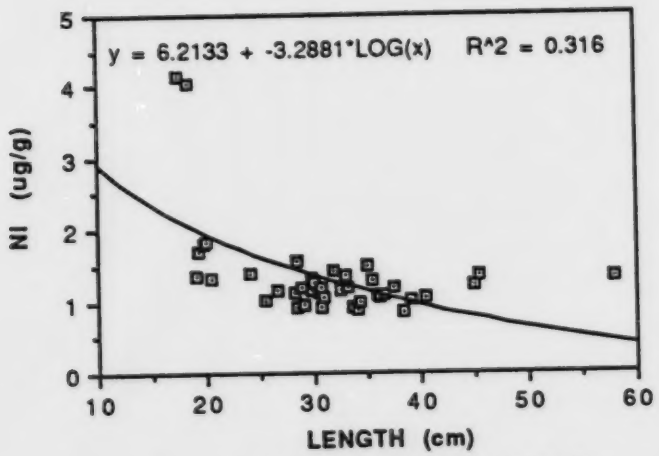

Figure 8: Nickel concentration in Dolly Varden liver tissue as a function of length.

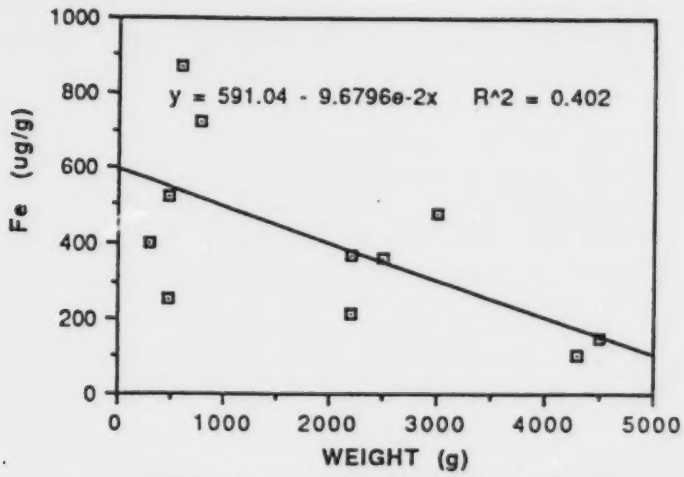

Figure 9: Iron concentration in lake trout liver tissue as a function of weight.

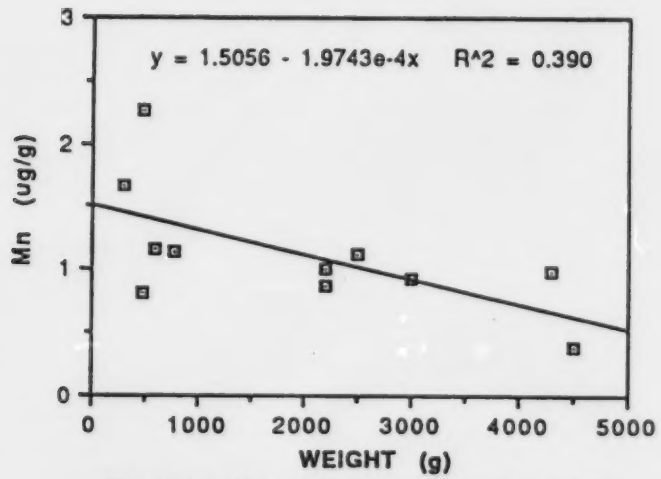

Figure 10: Manganese concentration in lake trout liver tissue as a function of weight.

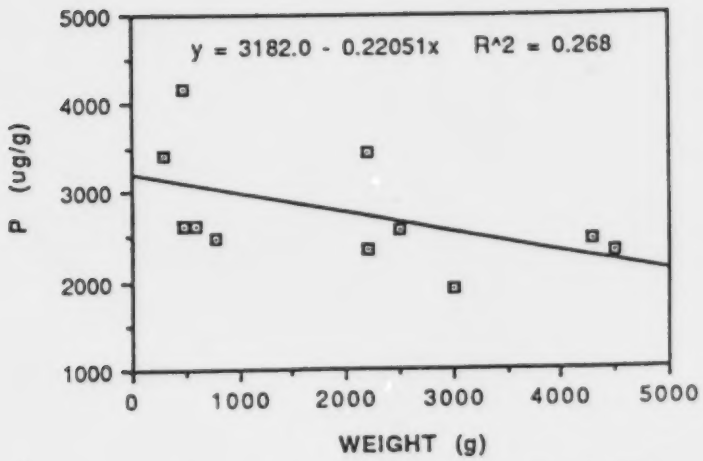

Figure 11: Phosphorus concentration in lake trout liver tissue as a function of weight.

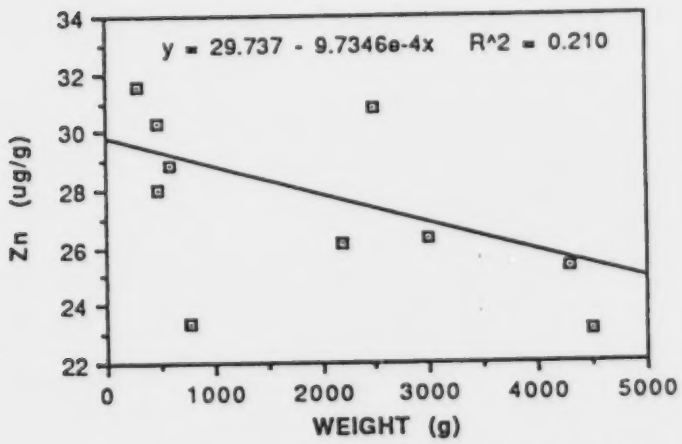

Figure 12: Zinc concentration in lake trout liver concentration as a function of weight.

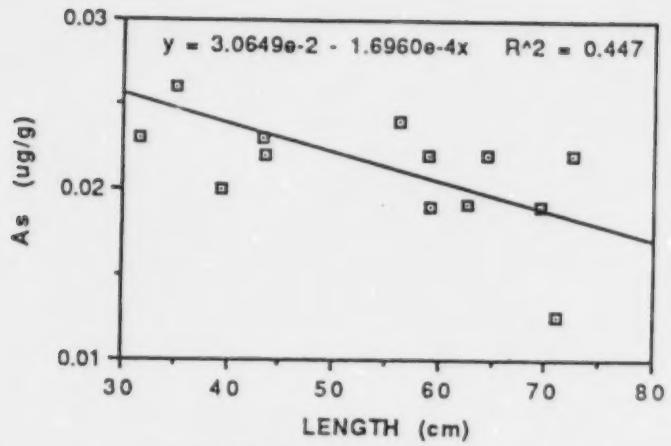

Figure 13: Arsenic concentration in lake trout muscle tissue as a function of length.

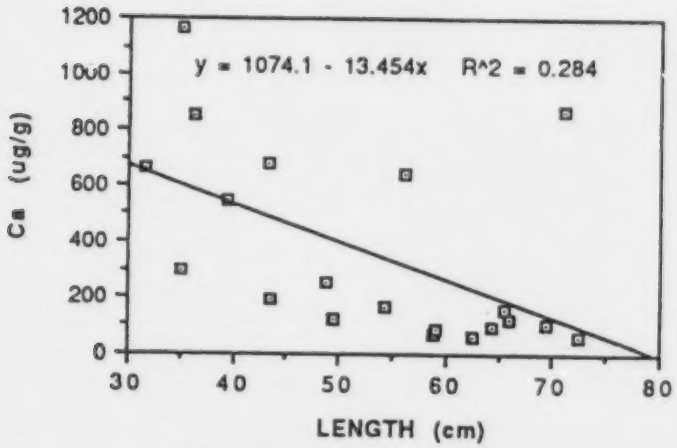

Figure 14: Calcium concentration in lake trout muscle tissue as a function of length.

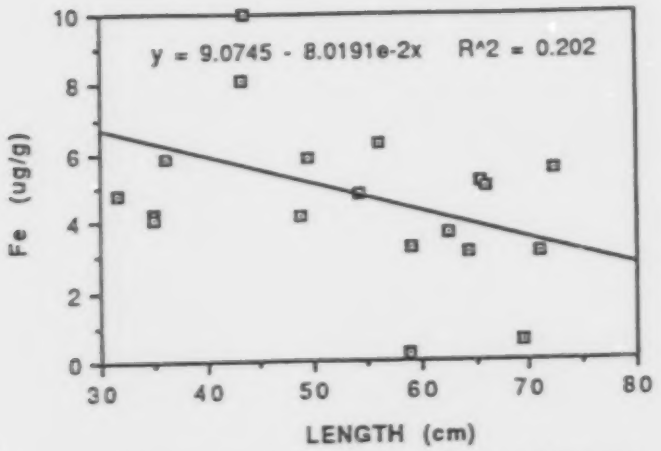

Figure 15: Iron concentration in lake trout muscle tissue as a function of length.

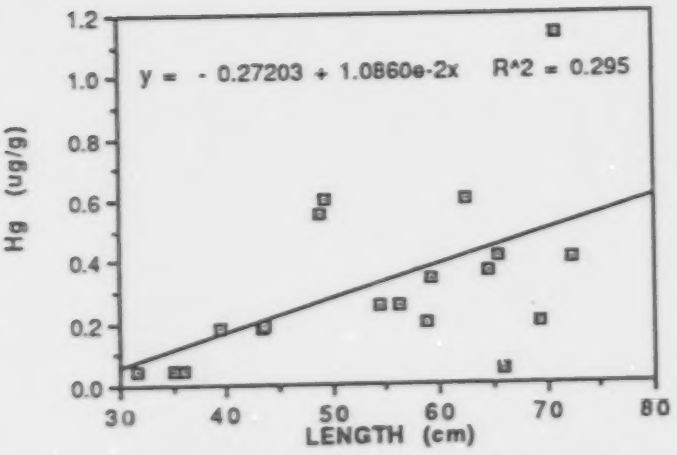

Figure 16: Mercury concentration in lake trout muscle tissue as a function of length.

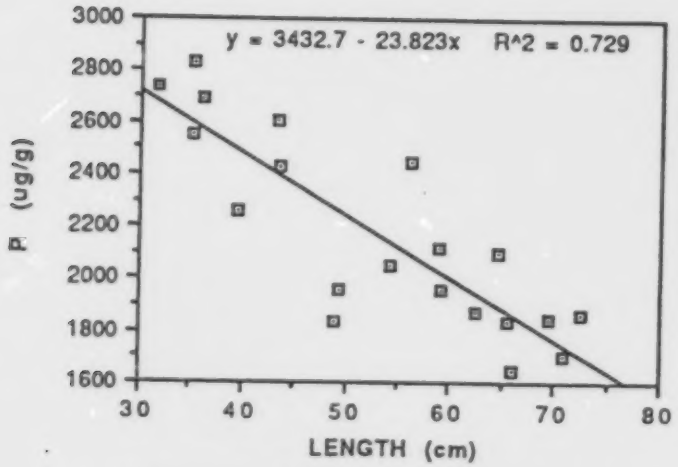

Figure 17: Phosphorus concentration in lake trout muscle tissue as a function of length.

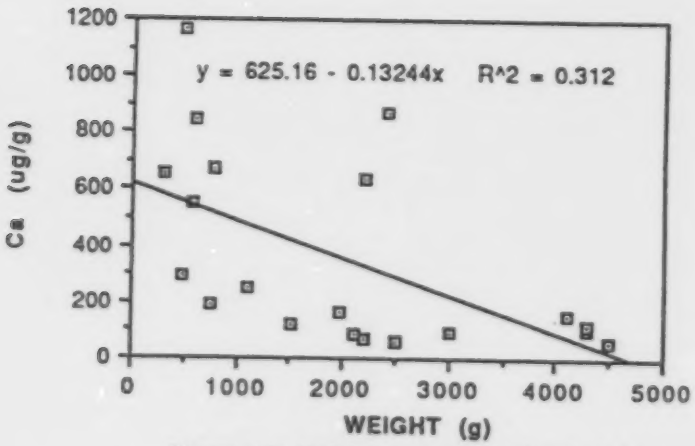

Figure 18: Calcium concentration in lake trout muscle tissue as a function of weight.

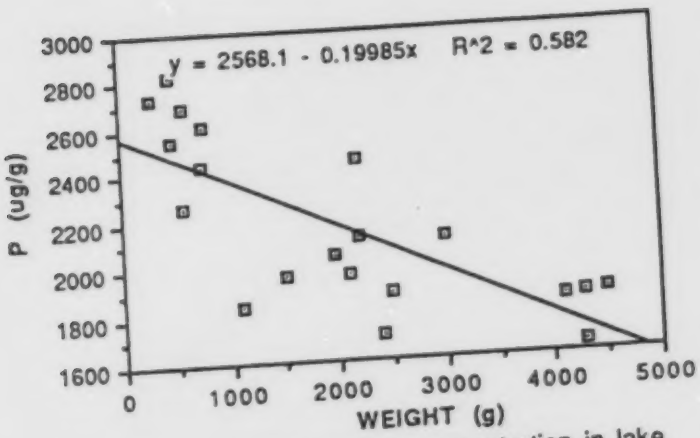

Figure 19: Phosphorus concentration in lake trout muscle tissue as a function of weight.

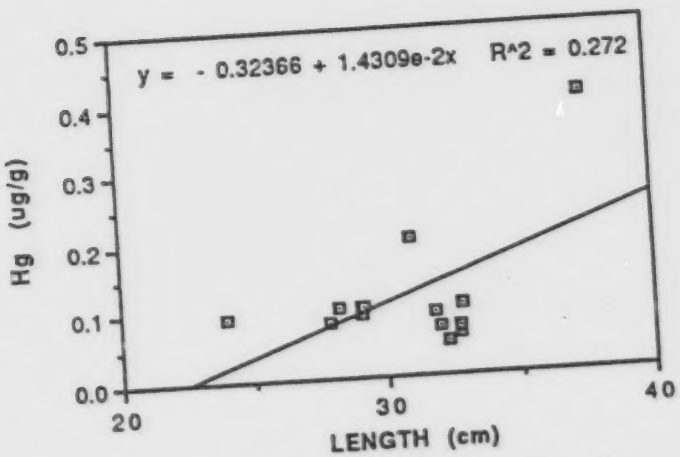

Figure 20: Mercury concentration in mountain whitefish muscle tissue as a function of length.

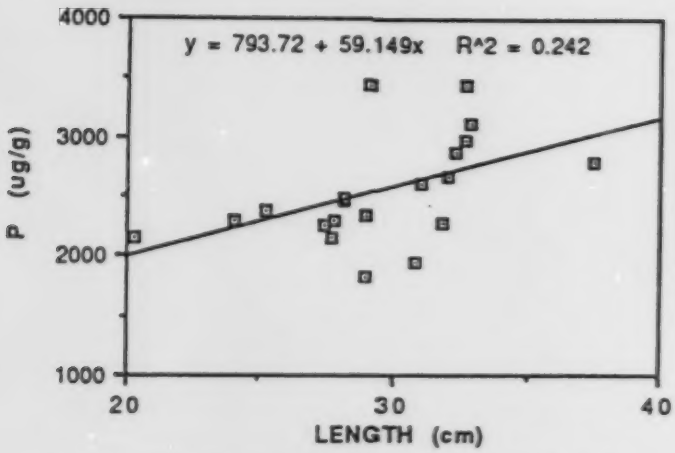

Figure 21: Phosphorus concentration in mountain whitefish muscle tissue as a function of length.

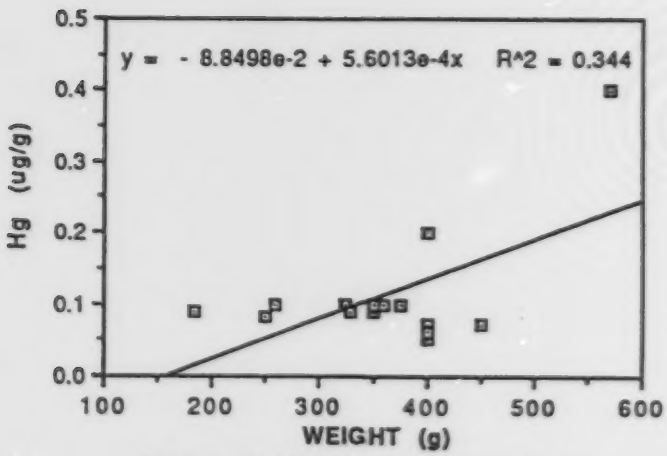

Figure 22: Mercury concentration in mountain whitefish muscle tissue as a function of weight.

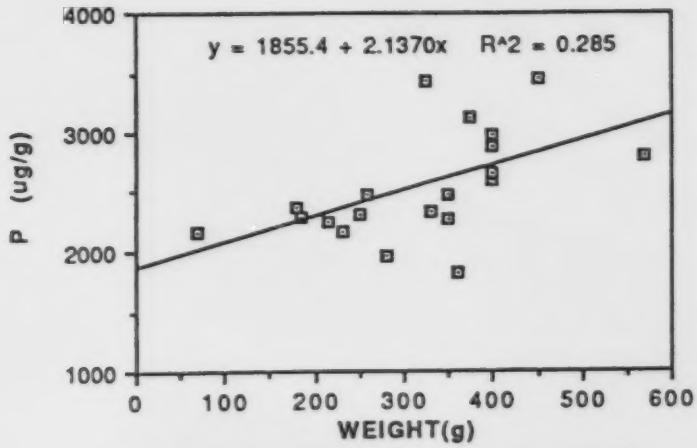

Figure 23: Phosphorus concentration in mountain whitefish muscle tissue as a function of weight.

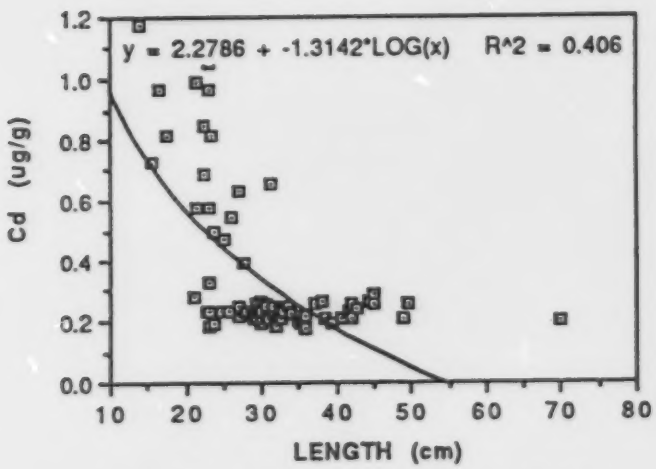

Figure 24: Cadmium concentration in rainbow liver tissue as a function of length.

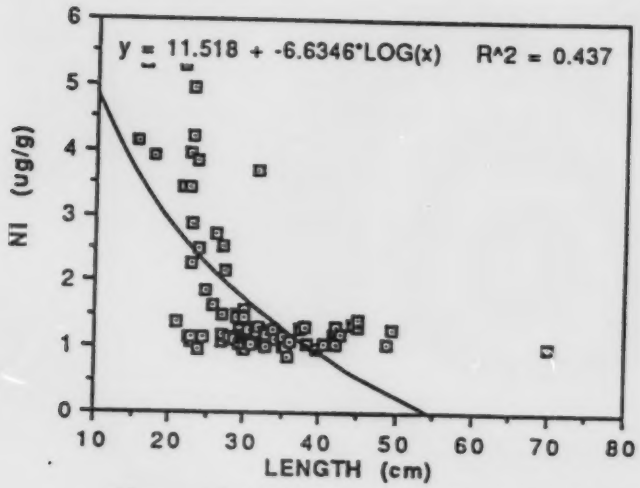

Figure 25: Nickel concentration in rainbow liver tissue as a function of length.

Appendix 5

Results of Kruskal-Wallis Tests Comparing Mean Metal Concentrations to Biogeoclimatic Zone

Kruskal-Wallis tests were used to test the H_0: $\mu_0 = \mu_1 = \mu_2 \ldots \mu_n$, where $\mu_0 \ldots \mu_n$ are the individual means from the biogeoclimatic zones in which samples were taken. If Prob > CHISQ is greater than 0.05 the means are not significantly different at the 95% significance level. Biogeoclimatic zones are abbreviated as follows:

- Interior Douglas Fir: IDF
- Coastal Douglas Fir: CDF
- Subalpine Mountain Hemlock: SMH
- Coastal Western Hemlock: CWH
- Subalpine Englemann Spruce - Subalpine Fir: SES-SF
- Cariboo Aspen - Lodgepole Pine: CA-LP
- Sub-Boreal Spruce: SBS
- Boreal White and Black Spruce: BWBS
- Alpine Tundra: AT.

Table 1: Results of Kruskal-Wallis tests comparing mean metal concentrations between cutthroat trout liver tissue in the CDF and CWH biogeoclimatic zones.

Metal	Prob > CHISQ	Interpretation
Al	0.4005	not significantly different
As	0.8758	not significantly different
Ba	0.2229	not significantly different
Be	0.1164	not significantly different
Ca	0.8356	not significantly different
Cd	0.1348	not significantly different
Cu	0.0937	not significantly different
Fe	0.0059	significantly different
Hg	0.1632	not significantly different
Mn	0.7576	not significantly different
Ni	0.0272	significantly different
P	0.0088	significantly different
Pb	0.0034	significantly different
Zn	0.7698	not significantly different

Table 2: Results of Kruskal-Wallis tests comparing mean metal concentrations between cutthroat trout muscle tissue in the CDF and CWH biogeoclimatic zones.

Metal	Prob > CHISQ	Interpretation
Al	0.0080	significantly different
As	0.0062	significantly different
Ba	0.0062	significantly different
Be	0.0062	significantly different
Ca	0.4307	not significantly different
Cd	0.0062	significantly different
Cu	0.1984	not significantly different
Fe	0.0039	significantly different
Hg	0.0001	significantly different
Mn	0.0127	significantly different
Ni	0.2975	not significantly different
P	0.0002	significantly different
Pb	0.5685	not significantly different
Zn	0.0253	significantly different

Table 3: Results of Kruskal-Wallis tests comparing mean metal concentrations between rainbow trout liver tissue in the IDF, SMH, CWH, CA-LP, SBS and BWBS biogeoclimatic zones.

Metal	Prob > CHISQ	Interpretation
Al	0.0001	significantly different
As	0.0008	significantly different
Ba	0.0001	significantly different
Be	0.0001	significantly different
Ca	0.0003	significantly different
Cd	0.0001	significantly different
Cu	0.0168	significantly different
Fe	0.0684	not significantly different
Hg	0.3776	not.significantly different *
Mn	0.0502	not significantly different
Ni	0.0001	significantly different
P	0.0263	significantly different
Pb	0.0001	significantly different
Zn	0.1256	not significantly different

* n = 3

Table 4: Results of Kruskal-Wallis tests comparing mean metal concentrations between rainbow trout muscle tissue in the IDF, SMH, CWH, CA-LP, SBS and BWBS biogeoclimatic zones.

Metal	Prob > CHISQ	Interpretation
Al	0.0001	significantly different
As	0.0940	not significantly different
Ba	0.0009	significantly different
Be	0.0010	significantly different
Ca	0.0001	significantly different
Cd	0.0010	significantly different
Cu	0.0716	not significantly different
Fe	0.0004	significantly different
Hg	0.0008	significantly different *
Mn	0.0003	significantly different
Ni	0.0001	significantly different
P	0.0001	significantly different
Pb	0.0002	significantly different
Zn	0.0001	significantly different

* n = 3

Table 5: Results of Kruskal-Wallis tests comparing mean metal concentrations between Dolly Varden char liver tissue in the CWH, SES-SF, SBS and AT biogeoclimatic zones.

Metal	Prob > CHISQ	Interpretation
Al	0.0046	significantly different
As	0.9496	not significantly different
Ba	0.0195	significantly different
Be	0.0195	significantly different
Ca	0.0001	significantly different
Cd	0.0589	not significantly different
Cu	0.0174	significantly different
Fe	0.1983	not significantly different
Hg	0.1043	not significantly different
Mn	0.1674	not significantly different
Ni	0.0149	significantly different
P	0.0139	significantly different
Pb	0.4263	not significantly different
Zn	0.1331	not significantly different

Table 6 Results of Kruskal-Wallis tests comparing mean metal concentrations between Dolly Varden char muscle tissue in the CWH, SES-SF, SBS and AT biogeoclimatic zones.

Metal	Prob > CHISQ	Interpretation
Al	0.0024	significantly different
As	0.0035	significantly different
Ba	0.0238	significantly different
Be	0.0238	significantly different
Ca	0.0238	significantly different
Cd	0.0238	significantly different
Cu	0.0520	not significantly different
Fe	0.0010	significantly different
Hg	0.0006	significantly different
Mn	0.0020	significantly different
Ni	0.1366	not significantly different
P	0.0177	significantly different
Pb	0.0290	significantly different
Zn	0.0093	significantly different

Table 7: Results of Kruskal-Wallis tests comparing mean metal concentrations between lake trout liver tissue in the IDF, SES-SF and AT biogeoclimatic zones.

Metal	Prob > CHISQ	Interpretation
Al	0.1294	not significantly different
As	0.0058	significantly different
Ba	0.0149	significantly different
Be	0.0149	significantly different
Ca	0.2724	not significantly different
Cd	0.0149	significantly different
Cu	0.0341	significantly different
Fe	0.3305	not significantly different
Hg	0.2207	not significantly different
Mn	0.3699	not significantly different
Ni	0.0149	significantly different
P	0.0207	significantly different
Pb	0.0123	significantly different
Zn	0.5503	not significantly different

Table 8: Results of Kruskal-Wallis tests comparing mean metal concentrations between lake trout muscle tissue in the IDF, SES-SF and AT biogeoclimatic zones.

Metal	Prob > CHISQ	Interpretation
Al	0.3520	not significantly different
As	0.0008	significantly different
Ba	0.0262	significantly different
Be	0.0080	significantly different
Ca	0.0093	significantly different
Cd	0.0080	significantly different
Cu	0.0019	significantly different
Fe	0.0566	not significantly different
Hg	0.0021	significantly different
Mn	0.0054	significantly different
Ni	0.0064	significantly different
P	0.0019	significantly different
Pb	0.0383	significantly different
Zn	0.1683	not significantly different

Appendix 6

Results of Kruskal-Wallis Tests Comparing Mean Metal Concentrations to Tectonic Regions

Kruskal-Wallis tests were used to test the H_0: $\mu_0 = \mu_1 = \mu_2 \ldots \mu_n$, where $\mu_0 \ldots \mu_n$ are the individual means from the tectonic regions in which samples were taken. If Prob > CHISQ is greater than 0.05 the means are not significantly different at the 95% significance level. Tectonic regions are abbreviated as follows:

- Omineca Belt: OB
- Interior Plateau: IP
- Rocky Mountains: RM
- Insular Belt: IB
- Cascade Mountains: CM
- Alberta Plateau: AP.

Table 1: Results of Kruskal-Wallis tests comparing mean metal concentrations between rainbow trout liver tissue in the OM, IP, RM, IB and AP tectonic regions.

Metal	Prob > CHISQ	Interpretation
Al	0.0090	significantly different
As	0.0515	not significantly different
Ba	0.1534	not significantly different
Be	0.1114	not significantly different
Ca	0.0001	significantly different
Cd	0.1489	not significantly different
Cu	0.0292	significantly different
Fe	0.3978	not significantly different
Hg	0.8071	not significantly different
Mn	0.0195	significantly different
Ni	0.1332	not significantly different
P	0.0262	significantly different
Pb	0.2558	not significantly different
Zn	0.0402	significantly different

Table 2: Results of Kruskal-Wallis tests comparing mean metal concentrations between rainbow trout muscle tissue in the OM, IP, RM, IB and AP tectonic regions

Metal	Prob > CHISQ	Interpretation
Al	0.0038	significantly different
As	0.0183	significantly different
Ba	0.0087	significantly different
Be	0.0048	significantly different
Ca	0.0343	significantly different
Cd	0.0048	significantly different
Cu	0.0290	significantly different
Fe	0.0007	significantly different
Hg	0.0483	significantly different
Mn	0.0160	significantly different
Ni	0.0221	significantly different
P	0.0001	significantly different
Pb	0.0910	not significantly different
Zn	0.4206	not significantly different

Table 3: Results of Kruskal-Wallis tests comparing mean metal concentrations between lake trout liver tissue in the OM and RM tectonic regions.

Metal	Prob > CHISQ	Interpretation
Al	0.0956	not significantly different
As	0.4829	not significantly different
Ba	0.9301	not significantly different
Be	0.9301	not significantly different
Ca	0.1605	not significantly different
Cd	0.9301	not significantly different
Cu	0.2195	not significantly different
Fe	0.2926	not significantly different
Hg	0.2207	not significantly different
Mn	0.4829	not significantly different
Ni	0.9301	not significantly different
P	0.0066	significantly different
Pb	0.8608	not significantly different
Zn	0.4299	not significantly different

Table 4: Results of Kruskal-Wallis tests comparing mean metal concentrations between lake trout muscle tissue in the OM and RM tectonic regions.

Metal	Prob > CHISQ	Interpretation
Al	0.7598	not significantly different
As	0.0260	significantly different
Ba	0.0717	not significantly different
Be	0.0487	significantly different
Ca	0.0066	significantly different
Cd	0.0487	significantly different
Cu	0.0031	significantly different
Fe	0.7598	not significantly different
Hg	0.0254	significantly different
Mn	0.0772	not significantly different
Ni	0.0772	not significantly different
P	0.0014	significantly different
Pb	0.1028	not significantly different
Zn	0.8385	not significantly different

Table 5: Results of Kruskal-Wallis tests comparing mean metal concentrations between Dolly Varden char liver tissue in the OM, IP, RM and IB tectonic regions.

Metal	Prob > CHISQ	Interpretation
Al	0.1671	not significantly different
As	0.5698	not significantly different
Ba	0.0205	significantly different
Be	0.0205	significantly different
Ca	0.0001	significantly different
Cd	0.0376	significantly different
Cu	0.0168	significantly different
Fe	0.2513	not significantly different
Hg	0.1043	not significantly different
Mn	0.1919	not significantly different
Ni	0.0158	significantly different
P	0.1672	significantly different
Pb	0.3344	not significantly different
Zn	0.1990	not significantly different

Table 6: Results of Kruskal-Wallis tests comparing mean metal concentrations between Dolly Varden char muscle tissue in the OM, IP, RM and IB tectonic regions.

Metal	Prob > CHISQ	Interpretation
Al	0.0018	significantly different
As	0.0037	significantly different
Ba	0.0247	significantly different
Be	0.0247	significantly different
Ca	0.0087	significantly different
Cd	0.0247	significantly different
Cu	0.0870	not significantly different
Fe	0.0021	significantly different
Hg	0.0006	significantly different
Mn	0.0042	significantly different
Ni	0.1007	not significantly different
P	0.0128	significantly different
Pb	0.0304	significantly different
Zn	0.0241	significantly different

Appendix 7

Mean Metal Concentrations by Lake, Species and Tissue Type

Units of Measurement:

Weight: grams

Length: centimetres

Moisture: percent (%)

Metal Concentration: µg/g wet-weight

Data in this appendix are presented with the mapsheet number (National Topographic Series) of each lake to aid in location and identification. Maps are available from the Canada Map Office, Department of Energy, Mines, and Resources, Ottawa. The biogeoclimatic zone which the lake is in is also listed. Biogeoclimatic zones are abbreviated as follows:

- Interior Douglas Fir: IDF
- Coastal Douglas Fir: CDF
- Subalpine Mountain Hemlock: SMH
- Coastal Western Hemlock: CWH
- Subalpine Englemann Spruce - Subalpine Fir: SES-SF
- Cariboo Aspen - Lodgepole Pine: CA-LP
- Sub-Boreal Spruce: SBS
- Boreal White and Black Spruce: BWBS
- Alpine Tundra: AT.

The tectonic region which each lake is in is also listed and these are abbreviated as follows:

- Omineca Belt: OB
- Interior Plateau: IP
- Rocky Mountains: RM
- Insular Belt: IB
- Cascade Mountains: CM
- Alberta Plateau: AP.

Site: Aid Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	22.50	0.94
WEIGHT	5	119.00	11.94
MOISTURE	6	0.70	0.05
AL	6	1.72	0.31
AS	6	0.08	0.03
BA	6	0.77	0.32
BE	6	0.77	0.32
CA	6	100.32	31.53
CD	6	0.77	0.32
CU	6	42.02	24.58
FE	6	300.81	68.25
HG	1	0.07	
MN	6	1.75	0.45
NI	6	3.80	1.49
P	6	4167.18	766.01
PB	6	0.82	0.31
ZN	6	30.85	5.28

Mapsheet: 082N11
Biogeoclimatic: IDF
Tectonic: RM

Site: Aid Lake
Species:Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	22.50	0.94
WEIGHT	5	119.00	11.94
MOISTURE	5	0.76	0.00
AL	5	0.66	0.19
AS	5	0.02	0.00
BA	5	0.24	0.00
BE	5	0.24	0.00
CA	5	306.76	85.44
CD	5	0.24	0.00
CU	5	0.24	0.00
FE	5	5.14	0.84
HG	5	0.06	0.01
MN	5	0.24	0.00
NI	5	1.19	0.02
P	5	2793.58	124.72
PB	5	0.33	0.13
ZN	5	4.62	0.55

Mapsheet: 094K10
Biogeoclimatic: BWBS
Tectonic: AP

Site: Andy Bailey Lake
Species: Pike
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	6	0.68	0.03
AL	6	1.19	0.53
AS	6	0.03	0.00
BA	6	0.32	0.03
BE	6	0.77	1.12
CA	6	49.01	32.04
CD	6	0.32	0.03
CU	6	63.72	28.27
FE	6	457.51	218.66
HG	1	0.05	
MN	6	1.40	0.33
NI	6	1.58	0.17
P	6	2253.23	220.64
PB	6	0.32	0.03
ZN	6	51.65	9.64

Site:Andy Bailey Lake
Species: Pike
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	5	0.78	0.00
AL	5	0.88	0.65
AS	5	0.02	0.00
BA	5	0.31	0.12
BE	5	0.22	0.00
CA	5	742.47	266.14
CD	5	0.22	0.00
CU	5	0.31	0.12
FE	5	4.93	0.69
HG	5	0.07	0.04
MN	5	0.92	0.19
NI	5	1.10	0.02
P	5	2474.54	104.36
PB	5	0.26	0.10
ZN	5	5.01	0.22

Site: Beaver Lake
Species: Coho
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	3	19.27	3.52
WEIGHT	3	85.00	51.96
MOISTURE	3	0.77	0.03
AL	3	3.58	2.05
AS	3	0.02	0.00
BA	3	0.23	0.03
BE	3	0.23	0.03
CA	3	84.99	18.81
CD	3	0.23	0.03
CU	3	6.84	3.11
FE	3	420.36	171.27
HG	0		
MN	3	3.71	3.11
NI	3	1.16	0.16
P	3	2788.13	128.56
PB	3	0.65	0.43
ZN	3	34.64	9.05

Mapsheet: 094J14
Biogeoclimatic: BWBS
Tectonic: AP

Site: Beaver Lake
Species: Coho
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	3	19.27	3.52
WEIGHT	3	85.00	51.96
MOISTURE	3	0.80	0.00
AL	3	1.02	0.34
AS	3	0.02	0.00
BA	3	0.21	0.00
BE	3	0.21	0.00
CA	3	227.24	103.02
CD	3	0.21	0.00
CU	3	0.34	0.12
FE	3	5.52	2.25
HG	0		
MN	3	0.34	0.12
NI	3	1.03	0.01
P	3	2213.30	127.34
PB	3	0.27	0.12
ZN	3	3.55	0.49

Site: Beaver Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	1	25.40	
WEIGHT	1	215.00	
MOISTURE	1	0.81	
AL	1	1.15	
AS	1	0.02	
BA	1	0.19	
BE	1	0.19	
CA	1	56.15	
CD	1	0.19	
CU	1	16.81	
FE	1	55.01	
HG	0		
MN	1	1.34	
NI	1	0.96	
P	1	2406.60	
PB	1	0.38	
ZN	1	16.04	

Site: Beaver Lake
Species:Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	1	25.40	
WEIGHT	1	215.00	
MOISTURE	1	0.76	
AL	1	0.98	
AS	1	0.02	
BA	1	0.25	
BE	1	0.25	
CA	1	191.83	
CD	1	0.25	
CU	1	0.49	
FE	1	5.88	
HG	1	0.30	
MN	1	0.25	
NI	1	1.23	
P	1	2523.50	
PB	1	0.25	
ZN	1	3.92	

Site: Beck Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	27.56	4.49
WEIGHT	5	275.00	128.06
MOISTURE	6	0.78	0.02
AL	6	0.60	0.21
AS	6	0.03	0.01
BA	6	0.26	0.11
BE	6	0.26	0.11
CA	6	55.71	6.46
CD	6	0.26	0.11
CU	6	4.53	2.57
FE	6	183.54	79.61
HG	1	0.10	
MN	6	1.44	0.27
NI	6	1.45	0.38
P	6	2817.88	277.27
PB	6	0.41	0.22
ZN	6	21.67	2.71

Mapsheet: 092G04
Biogeoclimatic: CDF
Tectonic: IB

Site:Beck Lake
Species:Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	4	28.90	3.87
WEIGHT	4	313.75	108.89
MOISTURE	4	0.77	0.02
AL	4	0.45	0.03
AS	4	0.02	0.00
BA	4	0.23	0.02
BE	4	0.23	0.02
CA	4	124.96	46.10
CD	4	0.23	0.02
CU	4	0.33	0.12
FE	4	5.38	3.61
HG	4	0.10	0.03
MN	4	0.23	0.02
NI	4	1.13	0.08
P	4	2195.06	131.71
PB	4	0.23	0.02
ZN	4	3.38	0.38

Site: Blackjack Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	23.36	4.64
WEIGHT	5	136.00	84.37
MOISTURE	5	0.80	0.03
AL	5	5.30	1.12
AS	5	0.09	0.08
BA	5	0.67	0.60
BE	5	0.67	0.60
CA	5	62.16	5.81
CD	5	0.67	0.60
CU	5	11.22	8.57
FE	5	208.02	73.29
HG	0		
MN	5	0.74	0.55
NI	5	3.46	3.10
P	5	2790.60	259.12
PB	5	0.90	0.69
ZN	5	24.45	6.55

Mapsheet: 092F01
Biogeoclimatic: CDF
Tectonic: IB

Site: Blackjack Lake
Species:Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	23.36	4.64
WEIGHT	5	136.00	84.37
MOISTURE	5	0.81	0.01
AL	5	5.29	2.41
AS	5	0.02	0.00
BA	5	0.19	0.01
BE	5	0.19	0.01
CA	5	548.58	604.06
CD	5	0.19	0.01
CU	5	0.23	0.09
FE	5	8.24	2.20
HG	5	0.10	0.08
MN	5	0.27	0.11
NI	5	1.23	0.18
P	5	2346.24	308.15
PB	5	0.31	0.11
ZN	5	4.05	0.63

Site: Blackwater Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	1	0.76	
AL	1	1.23	
AS	1	0.02	
BA	1	0.25	
BE	1	0.25	
CA	1	70.07	
CD	1	0.25	
CU	1	33.32	
FE	1	210.21	
HG	1	0.12	
MN	1	1.47	
NI	1	1.23	
P	1	3356.50	
PB	1	0.49	
ZN	1	28.67	

Mapsheet: 092F01
Biogeoclimatic: CDF
Tectonic: IB

Site: Blackwater Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	27.66	1.92
WEIGHT	5	279.00	86.05
MOISTURE	5	0.75	0.02
AL	5	0.97	1.06
AS	5	0.02	0.00
BA	5	0.25	0.02
BE	5	0.25	0.02
CA	5	247.21	128.57
CD	5	0.25	0.02
CU	5	0.25	0.02
FE	5	4.47	0.92
HG	5	0.09	0.01
MN	5	0.25	0.02
NI	5	1.24	0.10
P	5	2786.28	37.35
PB	5	0.34	0.12
ZN	5	4.95	0.74

Site: Burden Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	1	0.78	
AL	1	10.29	
AS	1	0.88	
BA	1	0.44	
BE	1	0.22	
CA	1	308.79	
CD	1	0.66	
CU	1	12.92	
FE	1	28.03	
HG	1	0.05	
MN	1	3.29	
NI	1	1.10	
P	1	1388.46	
PB	1	2.19	
ZN	1	179.58	

Mapsheet: 093O12
Biogeoclimatic: SBS
Tectonic: OB

Site: Burden Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	1	0.71	
AL	1	1.47	
AS	1	2.35	
BA	1	0.29	
BE	1	0.29	
CA	1	237.26	
CD	1	0.29	
CU	1	0.59	
FE	1	12.94	
HG	1	0.05	
MN	1	0.29	
NI	1	1.47	
P	1	2290.26	
PB	1	2.94	
ZN	1	4.41	

Site: Camp Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	32.80	2.43
WEIGHT	5	458.40	101.89
MOISTURE	5	0.80	0.01
AL	5	1.36	1.13
AS	0		
BA	5	0.20	0.01
BE	5	0.20	0.01
CA	5	242.41	314.48
CD	5	0.20	0.01
CU	5	102.81	61.91
FE	5	255.55	105.88
HG	0		
MN	5	4.01	4.76
NI	5	1.02	0.04
P	5	3115.36	651.87
PB	5	0.32	0.18
ZN	5	26.99	3.55

Mapsheet: 092F13

Site: Camp Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	32.80	2.43
WEIGHT	5	458.40	101.89
MOISTURE	5	0.80	0.02
AL	5	0.41	0.03
AS	0		
BA	5	0.20	0.02
BE	5	0.20	0.02
CA	5	99.18	28.41
CD	5	0.20	0.02
CU	5	0.24	0.09
FE	5	2.48	0.87
HG	5	0.12	0.01
MN	5	0.20	0.02
NI	5	1.02	0.08
P	5	1930.08	95.93
PB	5	0.24	0.09
ZN	5	3.33	0.25

Site: Chinaman Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	43.64	1.60
WEIGHT	5	1155.00	259.45
MOISTURE	6	0.75	0.02
AL	6	0.63	0.19
AS	6	0.03	0.00
BA	6	0.26	0.02
BE	6	0.26	0.02
CA	6	58.55	10.27
CD	6	0.26	0.02
CU	6	57.42	9.41
FE	6	210.99	70.84
HG	1	0.07	
MN	6	1.45	0.32
NI	6	1.28	0.11
P	6	2763.16	321.91
PB	6	0.29	0.09
ZN	6	24.22	2.13

Mapsheet: 094B01
Biogeoclimatic: CA-LP
Tectonic: AP

Site: Chinaman Lake
Species:Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	43.64	1.60
WEIGHT	5	1155.00	259.45
MOISTURE	5	0.72	0.04
AL	5	0.88	0.50
AS	5	0.03	0.00
BA	5	0.28	0.04
BE	5	0.28	0.04
CA	5	407.49	214.90
CD	5	0.28	0.04
CU	5	0.38	0.09
FE	5	5.85	3.16
HG	5	0.05	0.00
MN	5	0.28	0.04
NI	5	1.42	0.22
P	5	2419.79	102.13
PB	5	0.28	0.04
ZN	5	4.03	0.32

Site: Comfort Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	1	0.77	
AL	1	1.63	
AS	1	0.02	
BA	1	0.23	
BE	1	0.23	
CA	1	80.39	
CD	1	0.23	
CU	1	22.83	
FE	1	244.65	
HG	0		
MN	1	1.40	
NI	1	1.17	
P	1	3285.30	
PB	1	0.23	
ZN	1	25.16	

Mapsheet: 082N11
Biogeoclimatic: IDF
Tectonic: RM

Site: Comfort Lake
Species:Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	23.44	1.46
WEIGHT	5	136.00	25.10
MOISTURE	5	0.76	0.01
AL	5	1.22	0.92
AS	5	0.02	0.00
BA	5	0.24	0.01
BE	5	0.24	0.01
CA	5	265.68	126.74
CD	5	0.24	0.01
CU	5	0.24	0.01
FE	5	6.85	2.97
HG	5	0.05	0.00
MN	5	0.42	0.39
NI	5	1.21	0.05
P	5	2676.18	116.27
PB	5	0.29	0.11
ZN	5	4.33	0.58

Site: Dahl Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	26.34	2.26
WEIGHT	5	189.00	44.36
MOISTURE	5	0.75	0.01
AL	5	0.86	0.29
AS	5	0.04	0.01
BA	5	0.40	0.14
BE	5	0.40	0.14
CA	5	65.67	14.59
CD	5	0.40	0.14
CU	5	37.83	29.92
FE	5	280.69	75.31
HG	0		
MN	5	1.63	0.46
NI	5	2.03	0.55
P	5	3663.64	228.47
PB	5	0.40	0.14
ZN	5	28.83	1.47

Mapsheet: 093G14
Biogeoclimatic: CA-LP
Tectonic: IP

Site: Dahl Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	26.34	2.26
WEIGHT	5	189.00	44.36
MOISTURE	5	0.80	0.01
AL	5	2.55	1.26
AS	5	0.02	0.00
BA	5	0.20	0.01
BE	5	0.20	0.01
CA	5	941.62	1070.94
CD	5	0.20	0.01
CU	5	0.49	0.32
FE	5	2.66	0.77
HG	4	0.08	0.03
MN	5	0.37	0.27
NI	5	1.02	0.04
P	5	2688.44	543.47
PB	5	0.25	0.10
ZN	5	5.00	1.61

Site: Davie Lake
Species: Lake whitefish
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	33.14	2.91
WEIGHT	5	323.00	51.19
MOISTURE	6	0.77	0.01
AL	6	1.99	0.78
AS	6	0.05	0.02
BA	6	0.50	0.28
BE	6	0.50	0.28
CA	6	95.75	37.58
CD	6	0.50	0.28
CU	6	5.77	2.02
FE	6	175.54	123.56
HG	0		
MN	6	1.73	0.29
NI	6	2.55	1.03
P	6	3175.28	233.45
PB	6	0.54	0.40
ZN	6	26.96	3.37

Mapsheet: 093J10
Biogeoclimatic: SBS
Tectonic: 0B

Site: Davie Lake
Species: Lake whitefish
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	33.14	2.91
WEIGHT	5	323.00	51.19
MOISTURE	5	0.82	0.03
AL	5	0.36	0.05
AS	5	0.02	0.01
BA	5	0.18	0.03
BE	5	0.18	0.03
CA	5	330.23	158.70
CD	5	0.18	0.03
CU	5	0.18	0.03
FE	5	2.13	1.94
HG	5	0.23	0.08
MN	5	0.18	0.03
NI	5	0.90	0.14
P	5	2095.50	116.22
PB	5	0.18	0.03
ZN	5	3.73	1.01

Site: Davie Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	29.08	2.61
WEIGHT	5	223.00	52.99
MOISTURE	6	0.79	0.02
AL	6	0.80	0.36
AS	6	0.03	0.02
BA	6	0.31	0.18
BE	6	0.31	0.18
CA	6	79.13	47.66
CD	6	0.31	0.18
CU	6	54.69	33.94
FE	6	449.08	231.37
HG	1	0.10	
MN	6	1.47	0.89
NI	6	2.12	0.87
P	6	3939.97	2288.26
PB	6	0.28	0.12
ZN	6	38.19	27.03

Site:. Davie Lake
Species:Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	29.08	2.61
WEIGHT	5	223.00	52.99
MOISTURE	5	0.80	0.01
AL	5	1.23	0.84
AS	5	0.02	0.00
BA	5	0.32	0.27
BE	5	0.20	0.01
CA	5	289.90	29.88
CD	5	0.20	0.01
CU	5	0.31	0.17
FE	5	2.83	1.12
HG	5	0.16	0.07
MN	5	0.20	0.01
NI	5	0.99	0.06
P	5	2368.18	178.61
PB	5	0.20	0.01
ZN	5	3.60	0.28

Site: Echo Lake
Species: Kokanee
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	5	0.80	0.03
AL	5	0.55	0.12
AS	5	0.02	0.00
BA	5	0.20	0.03
BE	5	0.20	0.03
CA	5	53.72	29.00
CD	5	0.20	0.03
CU	5	33.60	42.76
FE	5	292.45	296.72
HG	0		
MN	5	1.14	0.26
NI	5	1.01	0.15
P	5	3363.36	971.32
PB	5	0.20	0.03
ZN	5	22.25	3.86

Mapsheet: 082L02
Biogeoclimatic: IDF
Tectonic: OB

Site:Echo Lake
Species: Kokanee
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	4	0.74	0.05
AL	4	0.57	0.11
AS	4	0.05	0.05
BA	4	0.26	0.05
BE	4	0.26	0.05
CA	4	185.11	71.77
CD	4	0.26	0.05
CU	4	0.31	0.10
FE	4	8.79	1.42
HG	4	0.08	0.01
MN	4	0.26	0.05
NI	4	1.34	0.22
P	4	2121.19	156.14
PB	4	0.26	0.05
ZN	4	3.51	0.15

Site: Echo Lake
Species: Lake trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	5	0.64	0.05
AL	5	0.80	0.17
AS	5	0.04	0.00
BA	5	0.36	0.05
BE	5	0.36	0.05
CA	5	55.18	27.90
CD	5	0.36	0.05
CU	5	20.54	5.49
FE	5	246.85	86.46
HG	0		
MN	5	1.40	0.58
NI	5	1.82	0.23
P	5	2495.07	303.31
PB	5	0.43	0.14
ZN	5	28.12	2.48

Site:Echo Lake
Species: Lake trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	5	0.75	0.01
AL	5	0.81	0.32
AS	5	0.03	0.00
BA	5	0.25	0.01
BE	5	0.25	0.01
CA	5	274.05	62.56
CD	5	0.25	0.01
CU	5	0.25	0.01
FE	5	8.63	3.24
HG	5	0.06	0.01
MN	5	0.30	0.11
NI	5	1.31	0.09
P	5	2234.08	238.47
PB	5	0.25	0.01
ZN	5	3.33	0.29

Site: Echo Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	5	0.78	0.01
AL	5	0.49	0.12
AS	5	0.02	0.00
BA	5	0.22	0.01
BE	5	0.22	0.01
CA	5	101.08	70.37
CD	5	0.22	0.01
CU	5	93.39	35.47
FE	5	151.27	50.80
HG	0		
MN	5	1.19	0.33
NI	5	1.11	0.05
P	5	2761.40	178.03
PB	5	0.27	0.11
ZN	5	23.14	1.75

Mapsheet: 082L02
Biogeoclimatic: IDF
Tectonic: OB

Site: Echo Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	5	0.77	0.02
AL	5	1.00	0.20
AS	5	0.02	0.00
BA	5	0.23	0.02
BE	5	0.23	0.02
CA	5	308.13	219.94
CD	5	0.23	0.02
CU	5	0.27	0.09
FE	5	11.82	1.65
HG	5	0.06	0.02
MN	5	0.28	0.11
NI	5	1.23	0.13
P	5	2280.55	142.16
PB	5	0.23	0.02
ZN	5	4.13	1.53

Site: Florence Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	23.56	0.52
WEIGHT	5	138.20	13.50
MOISTURE	6	0.78	0.01
AL	5	1.93	0.68
AS	6	0.02	0.00
BA	5	0.22	0.02
BE	5	0.22	0.02
CA	5	101.86	17.99
CD	5	0.22	0.02
CU	5	14.12	11.64
FE	5	139.99	32.24
HG	1	0.06	
MN	5	1.56	0.24
NI	5	1.08	0.08
P	5	2729.68	166.63
PB	6	0.39	0.25
ZN	5	25.23	9.78

Mapsheet: 092B05
Biogeoclimatic: CDF
Tectonic: IB

Site: Florence Lake
Species:Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	23.56	0.52
WEIGHT	5	138.20	13.50
MOISTURE	5	0.79	0.01
AL	5	0.62	0.12
AS	5	0.02	0.00
BA	5	0.21	0.01
BE	5	0.21	0.01
CA	5	264.93	42.14
CD	5	0.21	0.01
CU	5	0.33	0.12
FE	5	4.33	0.55
HG	5	0.09	0.02
MN	5	0.25	0.10
NI	5	1.04	0.07
P	5	2055.93	215.87
PB	5	0.29	0.12
ZN	5	3.78	0.30

Site: Flume Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	23.94	1.52
WEIGHT	5	138.60	26.55
MOISTURE	6	0.81	0.02
AL	6	2.02	0.39
AS	6	0.05	0.04
BA	6	0.19	0.02
BE	6	0.19	0.02
CA	6	57.51	17.83
CD	6	0.19	0.02
CU	6	8.05	5.36
FE	6	333.72	98.81
HG	1	0.08	
MN	6	1.46	0.40
NI	6	1.05	0.05
P	6	2652.08	297.89
PB	6	0.31	0.18
ZN	6	20.71	1.11

Mapsheet: 092F13
Biogeoclimatic: CWH
Tectonic: IB

Site: Flume Lake
Species: Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	23.94	1.52
WEIGHT	5	138.60	26.55
MOISTURE	5	0.77	0.02
AL	5	1.23	0.36
AS	5	0.02	0.00
BA	5	0.23	0.02
BE	5	0.23	0.02
CA	5	180.34	49.98
CD	5	0.23	0.02
CU	5	0.37	0.13
FE	5	7.94	2.40
HG	3	0.25	0.11
MN	5	0.33	0.14
NI	5	1.15	0.08
P	5	2447.80	188.52
PB	5	0.28	0.12
ZN	5	3.32	0.28

Site: Fox Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	29.06	1.39
WEIGHT	5	239.00	15.17
MOISTURE	5	0.78	0.02
AL	5	1.30	0.40
AS	0		
BA	5	0.22	0.02
BE	5	0.22	0.02
CA	5	110.60	8.69
CD	5	0.22	0.02
CU	5	152.95	99.30
FE	5	259.33	80.55
HG	0		
MN	5	1.85	0.41
NI	5	1.09	0.10
P	5	2961.02	281.39
PB	5	0.39	0.23
ZN	5	28.15	5.39

Mapsheet: 094E16
Biogeoclimatic: BWBS
Tectonic: RM

Site: Fox Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	29.06	1.39
WEIGHT	5	239.00	15.17
MOISTURE	5	0.81	0.01
AL	5	0.38	0.01
AS	0		
BA	5	0.19	0.01
BE	5	0.19	0.01
CA	5	114.46	79.52
CD	5	0.19	0.01
CU	5	0.22	0.07
FE	5	2.62	0.87
HG	5	0.10	0.03
MN	5	0.19	0.01
NI	5	1.06	0.13
P	5	1716.73	64.58
PB	5	0.19	0.01
ZN	5	2.96	0.47

Site: Germansen Lake
Species: Dolly Varden char
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	41.30	3.88
WEIGHT	5	718.00	209.09
MOISTURE	6	0.77	0.03
AL	6	0.49	0.08
AS	6	0.02	0.00
BA	6	0.23	0.03
BE	6	0.23	0.03
CA	6	48.94	9.97
CD	6	0.23	0.03
CU	6	3.17	1.80
FE	6	136.02	48.69
HG	1	0.29	
MN	6	1.11	0.26
NI	6	1.14	0.13
P	6	2357.14	116.47
PB	6	0.23	0.03
ZN	6	24.59	3.15

Mapsheet: 093N10
Biogeoclimatic: SBS
Tectonic: IP

Site: Germansen Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	41.30	3.88
WEIGHT	5	718.00	209.09
MOISTURE	5	0.78	0.01
AL	5	0.73	0.31
AS	5	0.02	0.00
BA	5	0.22	0.01
BE	5	0.22	0.01
CA	5	160.12	62.15
CD	5	0.22	0.01
CU	5	0.22	0.01
FE	5	4.45	1.59
HG	5	0.18	0.05
MN	5	0.22	0.01
NI	5	1.09	0.07
P	5	2317.80	118.47
PB	5	0.26	0.09
ZN	5	3.28	0.20

Site: Germansen Lake
Species: Mountain whitefish
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	27.60	2.08
WEIGHT	5	277.00	69.25
MOISTURE	6	0.78	0.02
AL	6	0.39	0.70
AS	6	0.03	0.01
BA	6	0.26	0.10
BE	6	0.26	0.10
CA	6	91.31	113.64
CD	6	0.26	0.10
CU	6	1.30	0.14
FE	6	61.77	19.46
HG	1	0.14	
MN	6	1.36	0.31
NI	6	1.24	0.39
P	6	2954.63	382.13
PB	6	0.37	0.37
ZN	6	20.51	2.17

Site: Germansen Lake
Species: Mountain whitefish
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	27.60	2.08
WEIGHT	5	277.00	69.25
MOISTURE	5	0.75	0.04
AL	5	2.22	1.26
AS	5	0.03	0.00
BA	5	0.25	0.04
BE	5	0.25	0.04
CA	5	213.00	129.81
CD	5	0.25	0.04
CU	5	0.25	0.04
FE	5	8.03	5.36
HG	5	0.09	0.01
MN	5	0.25	0.04
NI	5	1.27	0.21
P	5	2241.46	244.85
PB	5	0.30	0.12
ZN	5	3.30	0.37

Site: Grizzly Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	35.10	2.86
WEIGHT	5	440.00	48.73
MOISTURE	6	0.81	0.01
AL	6	2.05	1.78
AS	6	0.02	0.00
BA	6	0.19	0.01
BE	6	0.19	0.01
CA	6	41.99	5.58
CD	6	0.19	0.01
CU	6	36.13	15.33
FE	6	188.01	44.05
HG	1	0.05	
MN	6	1.00	0.13
NI	6	1.23	0.54
P	6	2502.80	296.69
PB	6	0.29	0.15
ZN	6	21.83	3.30

Mapsheet: 093G12
Biogeoclimatic: CA-LP
Tectonic: IP

Site: Grizzly Lake
Species:Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	43.20	18.39
WEIGHT	5	440.00	48.73
MOISTURE	5	0.77	0.02
AL	5	0.82	0.52
AS	5	0.02	0.00
BA	5	0.23	0.02
BE	5	0.23	0.02
CA	5	174.34	59.76
CD	5	0.23	0.02
CU	5	0.60	0.34
FE	5	9.70	9.11
HG	5	0.06	0.03
MN	5	0.23	0.02
NI	5	1.14	0.09
P	5	2610.98	79.98
PB	5	0.33	0.15
ZN	5	3.69	0.21

Site: Help Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	1	0.77	
AL	1	0.70	
AS	1	0.02	
BA	1	0.23	
BE	1	0.23	
CA	1	53.82	
CD	1	0.23	
CU	1	42.87	
FE	1	246.98	
HG	1	0.07	
MN	1	1.63	
NI	1	1.17	
P	1	3308.60	
PB	1	0.23	
ZN	1	25.63	

Mapsheet: 082N11
Biogeoclimatic: IDF
Tectonic: RM

Site: Help Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	26.16	1.64
WEIGHT	5	215.00	59.58
MOISTURE	5	0.77	0.02
AL	5	0.55	0.17
AS	5	0.02	0.00
BA	5	0.23	0.02
BE	5	0.23	0.02
CA	5	293.88	130.90
CD	5	0.23	0.02
CU	5	0.23	0.02
FE	4	5.18	1.43
HG	5	0.06	0.01
MN	5	0.23	0.02
NI	5	1.15	0.08
P	5	2686.56	134.86
PB	5	0.41	0.09
ZN	5	4.86	0.91

Site: Hilltout Lake
Species: Lake whitefish
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	4	32.25	4.35
WEIGHT	4	441.25	186.56
MOISTURE	4	0.81	0.02
AL	4	12.51	14.47
AS	4	0.03	0.02
BA	4	0.28	0.18
BE	4	0.28	0.18
CA	4	67.60	38.97
CD	4	0.28	0.18
CU	4	1.76	0.62
FE	4	83.84	53.77
HG	3	0.25	0.09
MN	4	1.74	0.42
NI	4	1.48	0.97
P	4	2734.05	388.16
PB	4	0.41	0.27
ZN	4	21.68	5.15

Mapsheet: 093E14
Biogeoclimatic: CA-LP
Tectonic: IP

Site:Hilltout Lake
Species:Lake whitefish
Tissue:Muscle

Variable	N	Mean	Std Dev
LENGTH	4	32.25	4.35
WEIGHT	4	441.25	186.56
MOISTURE	5	0.77	0.02
AL	5	2.48	1.72
AS	5	0.02	0.00
BA	5	0.23	0.02
BE	5	0.23	0.02
CA	5	310.27	108.58
CD	5	0.23	0.02
CU	5	0.27	0.08
FE	5	13.00	9.42
HG	3	0.17	0.08
MN	5	0.42	0.12
NI	5	1.15	0.11
P	5	2283.29	673.57
PB	5	0.54	0.60
ZN	5	11.13	14.46

Site: Jennings Lake
Species: Lake trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	4	55.95	14.86
WEIGHT	4	2258.75	1827.60
MOISTURE	6	0.80	0.02
AL	4	5.66	6.18
AS	4	0.02	0.00
BA	4	0.20	0.02
BE	4	0.20	0.02
CA	4	72.47	32.02
CD	4	0.20	0.02
CU	4	11.04	7.68
FE	4	568.94	335.94
HG	1	0.12	
MN	4	0.86	0.32
NI	4	1.01	0.09
P	4	2369.93	375.17
PB	4	0.20	0.02
ZN	4	25.89	3.54

Mapsheet: 092B05
Biogeoclimatic: CDF
Tectonic: IB

Site: Jennings Lake
Species: Lake trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	52.66	14.82
WEIGHT	5	1921.00	1753.70
MOISTURE	5	0.78	0.01
AL	5	0.43	0.02
AS	5	0.02	0.00
BA	5	0.26	0.10
BE	5	0.22	0.01
CA	5	313.34	279.88
CD	5	0.22	0.01
CU	5	0.22	0.01
FE	5	7.07	2.77
HG	5	0.26	0.11
MN	5	0.22	0.01
NI	5	1.08	0.05
P	5	2251.80	290.19
PB	5	0.26	0.10
ZN	5	3.03	0.64

Site: Johanson Lake
Species: Dolly Varden char
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	27.48	17.07
WEIGHT	5	473.00	909.63
MOISTURE	5	0.68	0.05
AL	5	1.32	1.48
AS	0		
BA	5	0.32	0.05
BE	5	0.32	0.05
CA	5	57.93	11.68
CD	5	0.32	0.05
CU	5	11.50	5.75
FE	5	145.37	104.94
HG	5	0.06	0.01
MN	5	1.06	0.03
NI	5	1.59	0.25
P	5	2638.88	264.36
PB	5	0.32	0.05
ZN	5	28.92	5.13

Mapsheet: 094D09

Site: Johanson Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	27.48	17.07
WEIGHT	5	473.00	909.63
MOISTURE	5	0.77	0.01
AL	5	0.46	0.02
AS	0		
BA	5	0.23	0.01
BE	5	0.23	0.01
CA	5	150.63	73.93
CD	5	0.23	0.01
CU	5	0.23	0.01
FE	5	8.31	7.14
HG	5	0.06	0.03
MN	5	0.23	0.01
NI	5	1.14	0.05
P	5	2145.67	126.72
PB	5	0.23	0.01
ZN	5	3.34	0.28

Site: Keta Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	24.66	2.48
WEIGHT	5	162.00	38.18
MOISTURE	6	0.72	0.05
AL	6	6.63	7.43
AS	6	0.06	0.04
BA	6	0.53	0.28
BE	6	0.49	0.31
CA	6	87.51	17.56
CD	6	0.53	0.28
CU	6	19.74	18.44
FE	6	241.20	109.30
HG	0		
MN	6	1.60	0.65
NI	6	2.58	1.33
P	6	3761.28	791.96
PB	6	0.57	0.24
ZN	6	31.88	5.52

Mapsheet: 092LO8
Biogeoclimatic: CWH
Tectonic: IB

Site: Keta Lake
Species: Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	24.66	2.48
WEIGHT	5	162.00	38.18
MOISTURE	5	0.77	0.02
AL	5	0.45	0.03
AS	5	0.02	0.00
BA	5	0.23	0.02
BE	5	0.23	0.02
CA	5	438.63	197.43
CD	5	0.23	0.02
CU	5	0.23	0.02
FE	5	3.53	1.07
HG	5	0.15	0.08
MN	5	0.31	0.17
NI	5	1.13	0.08
P	5	2537.78	129.15
PB	5	0.23	0.02
ZN	5	4.02	0.27

Site: Keta Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	1	20.00	
WEIGHT	1	100.00	
MOISTURE	1	0.78	
AL	1	0.67	
AS	1	0.02	
BA	1	0.22	
BE	1	0.22	
CA	1	79.07	
CD	1	0.22	
CU	1	0.45	
FE	1	6.94	
HG	1	0.14	
MN	1	0.67	
NI	1	1.12	
P	1	2396.80	
PB	1	0.22	
ZN	1	4.26	

Mapsheet: 092L08
Biogeoclimatic: CWH
Tectonic: IB

Site: Klinkit Lake
Species: Lake trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	64.20	5.68
WEIGHT	5	2700.00	908.30
MOISTURE	6	0.75	0.04
AL	4	2.55	3.45
AS	4	0.03	0.01
BA	4	0.26	0.05
BE	4	0.26	0.05
CA	4	47.10	4.02
CD	4	0.26	0.05
CU	4	11.76	2.53
FE	4	261.93	127.07
HG	1	0.09	.
MN	4	1.05	0.06
NI	4	1.28	0.25
P	4	2513.10	159.91
PB	4	0.26	0.05
ZN	4	28.47	3.90

Mapsheet: 104O11
Biogeoclimatic: AT
Tectonic: OB

Site: Klinkit Lake
Species: Lake trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	64.20	5.68
WEIGHT	5	2700.00	908.30
MOISTURE	5	0.82	0.04
AL	5	1.21	1.60
AS	5	0.02	0.00
BA	5	0.18	0.04
BE	5	0.18	0.04
CA	5	239.43	353.62
CD	5	0.18	0.04
CU	5	0.18	0.04
FE	5	2.16	1.62
HG	5	0.50	0.40
MN	5	0.18	0.04
NI	5	0.92	0.18
P	5	1899.41	153.14
PB	5	0.18	0.04
ZN	5	2.40	0.45

Site: Kluachezi Lake
Species: Arctic grayling
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	37.60	1.96
WEIGHT	5	640.00	28.50
MOISTURE	6	0.81	0.02
AL	6	0.41	0.10
AS	6	0.02	0.00
BA	6	0.19	0.02
BE	6	0.19	0.02
CA	6	88.04	37.43
CD	6	0.19	0.02
CU	6	2.54	0.76
FE	6	58.85	15.92
HG	1	0.08	
MN	6	1.49	0.35
NI	6	0.95	0.10
P	6	2501.92	201.59
PB	6	0.22	0.10
ZN	6	18.89	1.26

Mapsheet: 094G13
Biogeoclimatic: BWBS
Tectonic: RM

Site: Kluachezi Lake
Species: Arctic grayling
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	37.60	1.96
WEIGHT	5	640.00	28.50
MOISTURE	5	0.79	0.01
AL	5	0.42	0.02
AS	5	0.02	0.00
BA	5	0.39	0.24
BE	5	0.21	0.01
CA	5	726.96	603.15
CD	5	0.21	0.01
CU	5	0.21	0.01
FE	5	5.89	5.27
HG	4	0.10	0.07
MN	5	0.26	0.10
NI	5	1.06	0.05
P	5	2697.94	385.40
PB	5	0.21	0.01
ZN	5	1.78	0.25

Mapsheet: 094G13
Biogeoclimatic: BWBS
Tectonic: RM

Site: Kluachezi Lake
Species: Burbot
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	1	54.80	
WEIGHT	1	900.00	
MOISTURE	1	0.72	
AL	1	0.56	
AS	1	0.08	
BA	1	0.28	
BE	1	0.28	
CA	1	25.02	
CD	1	0.28	
CU	1	3.89	
FE	1	94.24	
HG	0		
MN	1	0.56	
NI	1	1.39	
P	1	1946.00	
PB	1	0.28	
ZN	1	18.35	

Site: Kluea Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	30.12	0.57
WEIGHT	5	307.00	33.47
MOISTURE	6	0.78	0.01
AL	6	2.74	1.28
AS	6	0.02	0.00
BA	6	0.22	0.01
BE	6	0.22	0.01
CA	6	59.31	24.57
CD	6	0.22	0.01
CU	6	90.56	40.91
FE	6	700.81	235.05
HG	1	0.06	
MN	6	1.52	0.30
NI	6	1.11	0.04
P	6	1931.26	1491.54
PB	6	0.22	0.01
ZN	6	27.26	2.81

Mapsheet: 104H12
Biogeoclimatic: SBS
Tectonic: IP

Site: Kluea Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	30.12	0.57
WEIGHT	5	307.00	33.47
MOISTURE	5	0.79	0.01
AL	5	0.63	0.19
AS	5	0.02	0.00
BA	5	0.21	0.01
BE	5	0.21	0.01
CA	5	349.24	104.37
CD	5	0.21	0.01
CU	5	0.33	0.17
FE	5	6.45	3.50
HG	0		
MN	5	0.21	0.01
NI	5	1.06	0.07
P	5	2316.82	150.10
PB	5	0.21	0.01
ZN	5	2.64	0.18

Site: Langford Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	7	0.80	0.01
AL	7	1.72	1.89
AS	7	0.02	0.00
BA	7	0.20	0.01
BE	7	0.20	0.01
CA	7	71.07	18.23
CD	7	0.20	0.01
CU	7	15.50	5.65
FE	7	311.60	276.38
HG	2	0.10	0.03
MN	7	1.18	0.15
NI	7	0.99	0.04
P	7	2496.64	139.56
PB	7	0.20	0.01
ZN	7	32.01	4.22

Mapsheet: 092B05
Biogeoclimatic: CDF
Tectonic: IB

Site: Langford Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	0		
WEIGHT	0		
MOISTURE	5	0.79	0.01
AL	5	0.64	0.51
AS	5	0.02	0.00
BA	5	0.21	0.01
BE	5	0.21	0.01
CA	5	153.67	66.70
CD	5	0.21	0.01
CU	5	0.47	0.19
FE	5	2.60	1.54
HG	5	0.10	0.01
MN	5	0.21	0.01
NI	5	1.05	0.05
P	5	1845.18	57.05
PB	5	0.21	0.01
ZN	5	3.60	1.02

Site: Little Bobtail Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	4	33.05	5.08
WEIGHT	4	446.25	219.98
MOISTURE	4	0.78	0.02
AL	4	1.42	1.94
AS	4	0.02	0.00
BA	4	0.22	0.02
BE	4	0.22	0.02
CA	4	49.49	11.03
CD	4	0.22	0.02
CU	4	11.52	7.34
FE	4	78.10	28.82
HG	0		
MN	4	0.88	0.19
NI	4	1.10	0.08
P	4	2693.50	238.62
PB	4	0.22	0.02
ZN	4	25.33	3.52

Mapsheet: 093G12
Biogeoclimatic: CA-LP
Tectonic: IP

Site: Little Bobtail Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	4	33.05	5.08
WEIGHT	4	446.25	219.98
MOISTURE	4	0.78	0.01
AL	4	0.54	0.12
AS	4	0.02	0.00
BA	4	0.22	0.01
BE	4	0.22	0.01
CA	4	834.09	645.61
CD	4	0.22	0.01
CU	4	0.27	0.10
FE	4	5.80	3.12
HG	4	0.07	0.03
MN	4	0.27	0.11
NI	4	1.08	0.03
P	4	2679.98	310.79
PB	4	0.32	0.12
ZN	4	5.38	0.47

Site: Mathers Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	34.60	2.30
WEIGHT	5	355.00	73.74
MOISTURE	6	0.78	0.03
AL	6	1.47	1.48
AS	6	0.02	0.00
BA	6	0.22	0.03
BE	6	0.22	0.03
CA	6	52.01	19.07
CD	6	0.22	0.03
CU	6	79.31	55.38
FE	6	227.00	128.28
HG	1	0.36	
MN	6	1.16	0.23
NI	6	1.12	0.14
P	6	3146.47	247.01
PB	6	0.22	0.03
ZN	6	29.55	4.48

Mapsheet: 103B13
Biogeoclimatic: CWH
Tectonic: IB

Site: Mathers Lake
Species: Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	34.60	2.30
WEIGHT	5	355.00	73.74
MOISTURE	5	0.79	0.01
AL	5	0.43	0.03
AS	5	0.02	0.00
BA	5	0.21	0.01
BE	5	0.21	0.01
CA	5	847.71	708.50
CD	5	0.21	0.01
CU	5	0.21	0.01
FE	5	1.19	0.44
HG	5	0.42	0.16
MN	5	0.34	0.20
NI	5	1.07	0.06
P	5	2609.60	336.18
PB	5	0.21	0.01
ZN	5	3.17	0.71

Site: Mayer Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	38.80	2.58
WEIGHT	5	803.00	172.72
MOISTURE	6	0.81	0.02
AL	6	2.36	1.30
AS	6	0.02	0.00
BA	6	0.19	0.02
BE	6	0.19	0.02
CA	6	65.32	9.27
CD	6	0.19	0.02
CU	6	28.68	30.67
FE	6	74.73	37.23
HG	1	0.70	
MN	6	1.40	0.21
NI	6	0.96	0.09
P	6	2784.42	266.99
PB	6	0.23	0.09
ZN	6	21.84	2.29

Mapsheet: 103F09
Biogeoclimatic: CWH
Tectonic: IB

Site: Mayer Lake
Species: Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	38.80	2.58
WEIGHT	5	803.00	172.72
MOISTURE	5	0.80	0.01
AL	5	0.40	0.01
AS	5	0.02	0.00
BA	5	0.20	0.01
BE	5	0.20	0.01
CA	5	277.00	171.25
CD	5	0.20	0.01
CU	5	0.20	0.01
FE	5	2.27	1.93
HG	5	0.64	0.18
MN	5	0.32	0.18
NI	5	1.09	0.16
P	5	2042.12	280.90
PB	5	0.20	0.01
ZN	5	2.83	0.30

Site: Mayer Lake
Species: Dolly Varden char
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	34.46	2.67
WEIGHT	5	569.00	117.81
MOISTURE	6	0.77	0.05
AL	6	0.82	0.48
AS	6	0.02	0.00
BA	6	0.23	0.05
BE	6	0.23	0.05
CA	6	38.08	7.86
CD	6	0.23	0.05
CU	6	21.37	9.77
FE	6	98.05	19.23
HG	1	0.05	
MN	6	1.10	0.44
NI	6	1.16	0.24
P	6	2015.74	538.35
PB	6	0.23	0.05
ZN	6	29.42	9.59

Mapsheet: 103F09
Biogeoclimatic: CWH
Tectonic: IB

Site: Mayer Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	34.46	2.67
WEIGHT	5	569.00	117.81
MOISTURE	5	0.76	0.01
AL	5	0.68	0.46
AS	5	0.07	0.03
BA	5	0.24	0.01
BE	5	0.24	0.01
CA	5	104.85	77.73
CD	5	0.24	0.01
CU	5	0.48	0.02
FE	5	3.40	0.65
HG	5	0.06	0.02
MN	5	0.24	0.01
NI	5	1.21	0.06
P	5	2549.80	52.59
PB	5	0.24	0.01
ZN	5	3.22	0.13

Site: McIvor Lake
Species: Arctic grayling
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	37.62	2.57
WEIGHT	5	670.00	125.50
MOISTURE	5	0.80	0.02
AL	5	0.57	0.30
AS	0		
BA	5	0.20	0.02
BE	5	0.20	0.02
CA	5	162.71	47.41
CD	5	0.20	0.02
CU	5	0.42	0.22
FE	5	4.00	0.35
HG	5	0.08	0.04
MN	5	0.20	0.02
NI	5	1.00	0.11
P	5	1744.93	122.94
PB	5	0.20	0.02
ZN	5	7.50	1.84

Mapsheet: 092K03
Biogeoclimatic: CWH
Tectonic: IB

Site: McQuarrie Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	22.80	0.27
WEIGHT	5	119.00	7.42
MOISTURE	5	0.72	0.06
AL	5	1.06	0.42
AS	5	2.82	0.62
BA	5	0.52	0.27
BE	5	0.52	0.27
CA	5	89.29	48.76
CD	5	0.52	0.27
CU	5	34.20	30.71
FE	5	519.65	245.04
HG	0		
MN	5	2.18	0.75
NI	5	2.73	1.11
P	5	3870.40	885.52
PB	5	7.64	5.61
ZN	5	39.08	11.53

Mapsheet: 093L10
Biogeoclimatic: CA-LP
Tectonic: IP

Site: McQuarrie Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	22.80	0.27
WEIGHT	5	119.00	7.42
MOISTURE	5	0.78	0.01
AL	5	0.44	0.01
AS	5	2.17	0.07
BA	5	0.22	0.01
BE	5	0.22	0.01
CA	5	137.17	44.10
CD	5	0.22	0.01
CU	5	0.75	0.70
FE	5	11.87	11.23
HG	5	0.08	0.01
MN	0		
NI	5	1.10	0.03
P	5	2146.40	169.81
PB	5	2.19	0.07
ZN	5	4.94	2.67

Mapsheet: 093L10
Biogeoclimatic: CA-LP
Tectonic: IP

Site: Mess Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	24.38	2.11
WEIGHT	5	164.00	57.16
MOISTURE	6	0.78	0.01
AL	6	1.19	0.85
AS	6	0.02	0.00
BA	6	0.22	0.01
BE	6	0.22	0.01
CA	6	97.85	89.69
CD	6	0.22	0.01
CU	6	28.07	17.85
FE	6	259.30	133.82
HG	1	0.05	.
MN	6	0.87	0.46
NI	6	1.12	0.07
P	6	3156.03	394.30
PB	6	0.30	0.10
ZN	6	21.72	7.58

Mapsheet: 104G07
Biogeoclimatic: BWBS
Tectonic: IP

Site:Mess Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	24.38	2.11
WEIGHT	5	164.00	57.16
MOISTURE	5	0.76	0.01
AL	5	0.76	0.52
AS	5	0.02	0.00
BA	5	0.24	0.01
BE	5	0.24	0.01
CA	5	218.56	57.29
CD	5	0.24	0.01
CU	5	0.28	0.11
FE	5	6.96	1.61
HG	5	0.05	0.00
MN	5	0.24	0.01
NI	5	1.18	0.06
P	5	2468.49	207.39
PB	5	0.24	0.01
ZN	5	3.64	0.22

Site: Mosquito Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	29.02	2.67
WEIGHT	5	277.00	90.87
MOISTURE	6	0.77	0.01
AL	6	2.34	1.60
AS	6	0.03	0.01
BA	6	0.26	0.09
BE	6	0.26	0.09
CA	6	53.01	12.25
CD	6	0.26	0.09
CU	6	4.52	1.86
FE	6	112.29	45.74
HG	0		
MN	6	1.51	0.24
NI	6	1.46	0.49
P	6	3212.12	157.93
PB	6	0.26	0.09
ZN	6	24.83	1.17

Mapsheet: 103F01
Biogeoclimatic: CWH
Tectonic: IB

Site: Mosquito Lake
Species: Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	29.02	2.67
WEIGHT	5	277.00	90.87
MOISTURE	5	0.79	0.01
AL	5	0.59	0.23
AS	5	0.02	0.00
BA	5	0.21	0.01
BE	5	0.21	0.01
CA	5	329.12	208.08
CD	5	0.21	0.01
CU	5	0.21	0.01
FE	5	4.58	1.07
HG	5	0.34	0.19
MN	5	0.25	0.09
NI	5	1.10	0.10
P	4	2623.28	62.21
PB	5	0.21	0.01
ZN	5	4.15	0.75

Mapsheet: 103F01
Biogeoclimatic: CWH
Tectonic: IB

Site: Mosquito Lake
Species: Dolly Varden char
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	28.34	2.29
WEIGHT	4	312.50	66.65
MOISTURE	6	0.79	0.02
AL	6	4.78	1.69
AS	6	0.02	0.01
BA	6	0.21	0.02
BE	6	0.21	0.02
CA	6	41.33	10.13
CD	6	0.24	0.09
CU	6	22.84	20.02
FE	6	394.86	135.83
HG	0		.
MN	6	2.38	0.52
NI	6	1.03	0.10
P	6	3122.93	398.16
PB	6	0.28	0.14
ZN	6	38.19	9.29

Site: Mosquito Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	28.34	2.29
WEIGHT	4	312.50	66.65
MOISTURE	5	0.78	0.01
AL	5	0.45	0.01
AS	5	0.02	0.00
BA	5	0.22	0.01
BE	5	0.22	0.01
CA	5	383.78	78.66
CD	5	0.22	0.01
CU	5	0.22	0.01
FE	5	4.98	1.04
HG	5	0.12	0.07
MN	5	0.79	0.41
NI	5	1.11	0.03
P	5	2824.32	76.79
PB	5	0.27	0.10
ZN	5	3.83	0.23

Site: Munro Lake
Species: Arctic grayling
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	40.64	1.34
WEIGHT	5	705.00	64.71
MOISTURE	5	0.75	0.02
AL	5	2.72	2.29
AS	0		
BA	5	0.25	0.02
BE	5	0.25	0.02
CA	5	118.13	67.71
CD	5	0.30	0.13
CU	5	8.26	2.04
FE	5	121.72	46.24
HG	0		
MN	5	1.99	0.50
NI	5	1.23	0.12
P	5	3010.28	344.07
PB	5	0.25	0.02
ZN	5	29.66	3.24

Mapsheet: 103P15
Biogeoclimatic: IWH
Tectonic: IP

Site: Munro Lake
Species: Arctic grayling
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	40.64	1.34
WEIGHT	5	705.00	64.71
MOISTURE	5	0.78	0.01
AL	5	0.61	0.28
AS	0		
BA	5	0.22	0.01
BE	5	0.22	0.01
CA	5	215.31	78.98
CD	5	0.22	0.01
CU	5	0.70	0.85
FE	5	6.79	0.73
HG	5	0.09	0.05
MN	5	0.22	0.01
NI	5	1.09	0.06
P	5	1851.76	63.34
PB	5	1.28	2.37
ZN	5	7.66	0.93

Mapsheet: 103P15
Biogeoclimatic: IWH
Tectonic: IP

Site: Nass Lake
Species: Dolly Varden char
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	4	36.25	9.00
WEIGHT	4	565.00	499.90
MOISTURE	4	0.76	0.07
AL	3	2.79	0.98
AS	4	0.03	0.01
BA	3	0.21	0.01
BE	3	0.21	0.01
CA	3	73.21	22.22
CD	3	0.27	0.10
CU	3	12.78	6.57
FE	3	457.18	97.15
HG	0		
MN	3	1.58	0.46
NI	3	1.04	0.06
P	3	2612.03	198.88
PB	4	0.52	0.40
ZN	3	29.45	4.68

Mapsheet: 104H03
Biogeoclimatic: SBS
Tectonic: IP

Site: Nass Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	4	36.25	9.00
WEIGHT	4	565.00	499.90
MOISTURE	4	0.79	0.01
AL	4	0.57	0.19
AS	4	0.02	0.00
BA	4	0.21	0.01
BE	4	0.21	0.01
CA	4	462.06	371.65
CD	4	0.21	0.01
CU	4	0.51	0.37
FE	4	6.60	1.43
HG	1	0.12	
MN	4	0.46	0.19
NI	4	1.04	0.06
P	4	2298.72	179.26
PB	4	0.21	0.01
ZN	4	3.57	0.96

Site: Nass Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	30.22	1.74
WEIGHT	5	299.00	62.29
MOISTURE	6	0.76	0.02
AL	5	5.48	3.00
AS	6	0.03	0.01
BA	5	0.35	0.24
BE	5	0.25	0.01
CA	5	69.92	28.65
CD	5	0.25	0.01
CU	5	11.87	8.62
FE	5	453.64	164.73
HG	1	0.05	
MN	5	1.63	0.58
NI	5	1.23	0.07
P	5	2966.03	610.99
PB	6	0.24	0.02
ZN	5	22.51	4.50

Site: Nass Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	30.22	1.74
WEIGHT	5	299.00	62.29
MOISTURE	5	0.79	0.01
AL	4	0.78	0.31
AS	5	0.02	0.00
BA	4	0.31	0.20
BE	4	0.21	0.01
CA	4	438.27	283.29
CD	4	0.21	0.01
CU	4	0.21	0.01
FE	4	7.56	2.70
HG	0		
MN	4	0.36	0.19
NI	4	1.04	0.04
P	4	2389.83	136.76
PB	5	0.21	0.01
ZN	4	3.70	0.29

Mapsheet: 104H03
Biogeoclimatic: SBS
Tectonic: IP

Site: Nellian Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	26.80	3.49
WEIGHT	5	303.00	84.90
MOISTURE	6	0.74	0.04
AL	6	6.09	6.67
AS	6	0.03	0.02
BA	6	0.31	0.16
BE	6	0.31	0.16
CA	6	66.76	13.45
CD	6	0.31	0.16
CU	6	47.74	9.94
FE	6	201.01	58.15
HG	3	0.31	0.06
MN	6	1.47	0.42
NI	6	1.56	0.49
P	6	2670.75	460.40
PB	6	0.43	0.21
ZN	6	25.51	4.47

Mapsheet: 093K05
Biogeoclimatic: SBS
Tectonic: IP

Site: Nellian Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	26.80	3.49
WEIGHT	5	303.00	84.90
MOISTURE	5	0.73	0.01
AL	5	6.23	3.16
AS	5	0.03	0.00
BA	5	0.27	0.01
BE	5	0.27	0.01
CA	5	374.17	277.20
CD	5	0.27	0.01
CU	5	0.44	0.38
FE	5	25.94	20.50
HG	4	0.25	0.10
MN	5	0.33	0.13
NI	5	2.09	1.62
P	5	2394.40	756.30
PB	5	0.86	1.00
ZN	5	4.41	1.21

Site: Poison Lake (north)
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	1	70.00	
WEIGHT	1	4400.00	
MOISTURE	1	0.80	
AL	1	0.40	
AS	1	0.02	
BA	1	0.20	
BE	1	0.20	
CA	1	43.22	
CD	1	0.20	
CU	1	121.61	
FE	1	570.84	
HG	0		
MN	1	1.21	
NI	1	1.01	
P	1	5346.60	
PB	1	0.20	
ZN	1	22.51	

Mapsheet: 093C11
Biogeoclimatic: CA-LP
Tectonic: IP

Site: Poison Lake (north)
Species:Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	1	70.00	
WEIGHT	1	4400.00	
MOISTURE	1	0.72	
AL	1	0.57	
AS	1	0.03	
BA	1	0.29	
BE	1	0.29	
CA	1	195.23	
CD	1	0.29	
CU	1	0.86	
FE	1	17.67	
HG	1	0.15	
MN	1	0.29	
NI	1	1.43	
P	1	3990.00	
PB	1	0.29	
ZN	1	9.12	

Mapsheet: 093C11
Biogeoclimatic: CA-LP
Tectonic: IP

Site: Prairie Lake
Species: Lake trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	56.84	8.42
WEIGHT	5	2600.00	1494.68
MOISTURE	5	0.76	0.05
AL	5	0.83	0.32
AS	0		
BA	5	0.24	0.05
BE	5	0.24	0.05
CA	5	163.28	54.02
CD	5	0.24	0.05
CU	5	0.24	0.05
FE	5	4.98	0.60
HG	5	0.37	0.23
MN	5	0.24	0.05
NI	5	1.22	0.19
P	5	1865.69	151.35
PB	5	0.24	0.05
ZN	5	3.04	0.26

Mapsheet: 103J13

Site: Prairie Lake
Species:Lake trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	34.28	0.95
WEIGHT	5	547.00	43.67
MOISTURE	5	0.81	0.01
AL	5	0.59	0.39
AS	0		
BA	5	0.19	0.01
BE	5	0.19	0.01
CA	5	135.05	21.13
CD	5	0.19	0.01
CU	5	0.23	0.11
FE	5	4.52	0.38
HG	5	0.06	0.01
MN	5	0.19	0.01
NI	5	1.00	0.08
P	5	1660.61	109.28
PB	5	0.36	0.39
ZN	5	6.25	2.41

Site: Prospect Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	23.68	3.04
WEIGHT	5	153.40	53.94
MOISTURE	6	0.79	0.03
AL	6	2.03	0.98
AS	6	0.02	0.00
BA	6	0.24	0.06
BE	6	0.24	0.06
CA	6	71.50	12.54
CD	6	0.24	0.06
CU	6	21.50	10.59
FE	6	194.30	42.82
HG	0		
MN	6	1.53	0.32
NI	6	1.38	0.44
P	6	2495.17	296.81
PB	6	0.38	0.16
ZN	6	26.17	4.09

Mapsheet: 092B11
Biogeoclimatic: CDF
Tectonic: IB

Site: Prospect Lake
Species:Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	23.68	3.04
WEIGHT	5	153.40	53.94
MOISTURE	5	0.79	0.01
AL	5	0.71	0.24
AS	5	0.02	0.00
BA	5	0.21	0.01
BE	5	0.21	0.01
CA	5	227.38	50.39
CD	5	0.21	0.01
CU	5	0.55	0.20
FE	5	4.99	0.61
HG	5	0.12	0.03
MN	5	0.21	0.01
NI	5	1.05	0.04
P	5	2097.80	162.19
PB	5	0.29	0.12
ZN	5	3.90	0.31

Mapsheet: 092B11
Biogeoclimatic: CDF
Tectonic: IB

Site: Roberts Lake
Species: Dolly Varden char
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	29.52	0.83
WEIGHT	5	334.00	43.79
MOISTURE	5	0.74	0.03
AL	5	1.44	0.82
AS	0		
BA	5	0.26	0.03
BE	5	0.26	0.03
CA	5	41.87	3.91
CD	5	0.26	0.03
CU	5	1.93	0.76
FE	5	228.08	137.40
HG	0		
MN	5	1.87	0.85
NI	5	1.28	0.17
P	5	3401.68	569.03
PB	5	0.41	0.36
ZN	5	28.67	7.17

Mapsheet: 092KO4
Biogeoclimatic: CWH
Tectonic: IB

Site: Roberts Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	29.52	0.83
WEIGHT	5	334.00	43.79
MOISTURE	5	0.79	0.01
AL	5	1.11	0.79
AS	0		
BA	5	0.21	0.01
BE	5	0.21	0.01
CA	5	176.18	36.88
CD	5	0.21	0.01
CU	5	0.68	0.21
FE	5	5.20	0.85
HG	5	0.05	0.00
MN	5	0.21	0.01
NI	5	1.07	0.05
P	5	1799.97	89.61
PB	5	0.30	0.18
ZN	5	4.64	0.52

Site: Roberts Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	32.94	0.98
WEIGHT	5	421.00	43.36
MOISTURE	5	0.76	0.01
AL	5	1.26	0.44
AS	0		
BA	5	0.24	0.01
BE	5	0.24	0.01
CA	5	66.51	13.21
CD	5	0.24	0.01
CU	5	36.30	32.76
FE	5	403.62	167.49
HG	0		
MN	5	1.59	0.25
NI	5	1.21	0.05
P	5	3018.14	165.45
PB	5	0.49	0.18
ZN	5	25.64	1.67

Site: Roberts Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	32.94	0.98
WEIGHT	5	421.00	43.36
MOISTURE	5	0.79	0.01
AL	5	0.54	0.31
AS	0		
BA	5	0.21	0.01
BE	5	0.21	0.01
CA	5	146.83	52.54
CD	5	0.21	0.01
CU	5	0.91	0.60
FE	5	3.56	0.94
HG	5	0.05	0.00
MN	5	0.21	0.01
NI	5	1.03	0.04
P	5	1734.41	69.40
PB	5	0.25	0.11
ZN	5	3.87	0.50

Mapsheet: 092KO4
Biogeoclimatic: CWH
Tectonic: IB

Site: Silver Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	16.00	1.33
WEIGHT	5	51.00	11.94
MOISTURE	4	0.77	0.02
AL	4	6.39	2.18
AS	4	0.08	0.04
BA	4	0.93	0.20
BE	4	0.93	0.20
CA	4	85.86	14.44
CD	4	0.93	0.20
CU	4	34.06	29.57
FE	4	232.48	45.97
HG	0		
MN	4	1.82	0.60
NI	4	4.70	0.79
P	4	2934.05	449.99
PB	4	2.32	0.18
ZN	4	27.79	2.25

Mapsheet: 092B13
Biogeoclimatic: SMH
Tectonic: IB

Site: Silver Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	16.00	1.33
WEIGHT	5	51.00	11.94
MOISTURE	5	0.76	0.02
AL	5	0.98	0.40
AS	5	0.02	0.00
BA	5	0.24	0.02
BE	5	0.24	0.02
CA	5	582.97	45.80
CD	5	0.24	0.02
CU	5	0.28	0.09
FE	5	6.83	1.80
HG	0		
MN	5	0.33	0.12
NI	5	1.52	0.15
P	5	2528.82	91.49
PB	5	0.46	0.31
ZN	5	5.48	0.51

Site: Shawnigan Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	29.84	5.74
WEIGHT	5	329.00	222.95
MOISTURE	6	0.79	0.05
AL	6	1.27	0.44
AS	6	0.03	0.01
BA	6	0.31	0.15
BE	6	0.31	0.15
CA	6	53.52	22.12
CD	6	0.31	0.15
CU	6	6.79	3.24
FE	6	350.90	166.05
HG	2	0.56	0.45
MN	6	1.18	0.33
NI	6	1.46	0.66
P	6	2201.88	1109.37
PB	6	0.42	0.18
ZN	6	22.10	5.80

Mapsheet: 092B12
Biogeoclimatic: CDF
Tectonic: IB

Site: Skidegate Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	36.16	4.31
WEIGHT	5	602.00	188.27
MOISTURE	6	0.77	0.03
AL	6	1.14	0.53
AS	6	0.02	0.00
BA	6	0.23	0.03
BE	6	0.23	0.03
CA	6	53.08	7.09
CD	6	0.23	0.03
CU	6	20.25	16.14
FE	6	80.83	50.52
HG	1	0.36	
MN	6	1.27	0.22
NI	6	1.14	0.15
P	6	2647.72	230.28
PB	6	0.26	0.09
ZN	6	20.71	1.81

Mapsheet: 103G04
Biogeoclimatic: CWH
Tectonic: IB

Site: Skidegate Lake
Species: Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	36.16	4.31
WEIGHT	5	602.00	188.27
MOISTURE	5	0.76	0.01
AL	5	0.84	0.82
AS	5	0.02	0.00
BA	5	0.24	0.01
BE	5	0.24	0.01
CA	5	409.38	303.94
CD	5	0.24	0.01
CU	5	0.33	0.12
FE	5	3.98	1.04
HG	5	0.66	0.35
MN	5	0.43	0.43
NI	5	1.18	0.05
P	5	2546.00	243.49
PB	5	0.33	0.20
ZN	5	3.50	0.59

Site: Skidegate Lake
Species: Dolly Varden char
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	34.30	2.00
WEIGHT	5	458.00	150.02
MOISTURE	6	0.76	0.04
AL	6	0.48	0.08
AS	6	0.02	0.00
BA	6	0.24	0.04
BE	6	0.24	0.04
CA	6	40.06	4.57
CD	6	0.24	0.04
CU	6	20.27	13.85
FE	6	108.46	34.12
HG	1	0.05	
MN	6	1.03	0.27
NI	6	1.21	0.20
P	6	2493.33	268.00
PB	6	0.24	0.04
ZN	6	29.80	4.70

Site: Skidegate Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	34.30	2.00
WEIGHT	5	458.00	150.02
MOISTURE	5	0.74	0.01
AL	5	0.51	0.01
AS	5	0.06	0.05
BA	5	0.26	0.01
BE	5	0.26	0.01
CA	5	55.45	25.93
CD	5	0.26	0.01
CU	5	0.51	0.01
FE	5	4.97	1.04
HG	5	0.12	0.10
MN	5	0.26	0.01
NI	5	1.28	0.03
P	5	2509.40	90.62
PB	5	0.26	0.01
ZN	5	3.59	0.31

Site: Stowell Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	31.42	2.27
WEIGHT	5	335.00	72.02
MOISTURE	6	0.78	0.01
AL	6	1.82	1.05
AS	6	0.03	0.01
BA	6	0.26	0.10
BE	6	0.26	0.10
CA	6	34.22	5.57
CD	6	0.26	0.10
CU	6	11.55	5.40
FE	6	375.24	219.40
HG	1	0.08	
MN	6	1.27	0.20
NI	6	1.31	0.37
P	6	2348.92	1172.03
PB	6	0.58	0.69
ZN	6	21.36	1.94

Mapsheet: 092B14
Biogeoclimatic: CDF
Tectonic: 1B

Site: Summit Lake
Species: Lake trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	38.84	9.85
WEIGHT	5	810.00	784.34
MOISTURE	6	0.76	0.03
AL	6	0.82	0.46
AS	6	0.02	0.00
BA	6	0.28	0.10
BE	6	0.28	0.10
CA	6	66.07	28.58
CD	6	0.28	0.10
CU	6	10.70	5.71
FE	6	450.33	236.72
HG	1	0.05	.
MN	6	1.33	0.55
NI	6	1.44	0.60
P	6	3205.64	603.18
PB	6	0.28	0.10
ZN	6	28.82	1.88

Mapsheet: 094K10
Biogeoclimatic: SES-SF
Tectonic: RM

Site: Summit Lake
Species:Lake trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	38.84	9.85
WEIGHT	5	810.00	784.34
MOISTURE	5	0.75	0.02
AL	5	0.90	0.90
AS	5	0.03	0.00
BA	5	0.31	0.12
BE	5	0.25	0.02
CA	5	720.98	317.41
CD	5	0.25	0.02
CU	5	0.44	0.30
FE	5	5.04	0.99
HG	5	0.09	0.09
MN	5	0.25	0.02
NI	5	1.27	0.10
P	5	2650.72	153.23
PB	5	0.25	0.02
ZN	5	3.54	1.85

Site: Summit Lake
Species: Mountain whitefish
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	32.50	0.34
WEIGHT	5	405.00	27.39
MOISTURE	6	0.77	0.02
AL	6	1.83	0.77
AS	6	0.03	0.01
BA	6	0.27	0.08
BE	6	0.27	0.08
CA	6	102.49	57.10
CD	6	0.27	0.08
CU	6	2.16	0.88
FE	6	113.64	31.30
HG	1	0.10	
MN	6	1.58	0.42
NI	6	1.29	0.33
P	6	3153.98	389.76
PB	6	0.49	0.42
ZN	6	23.66	2.53

Site: Summit Lake
Species:Mountain whitefish
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	32.50	0.34
WEIGHT	5	405.00	27.39
MOISTURE	5	0.74	0.02
AL	5	0.87	0.65
AS	5	0.03	0.00
BA	5	0.54	0.48
BE	5	0.26	0.02
CA	5	1194.28	734.39
CD	5	0.26	0.02
CU	5	0.41	0.34
FE	5	6.31	2.03
HG	5	0.07	0.02
MN	5	0.35	0.19
NI	5	1.30	0.12
P	5	3014.63	292.99
PB	5	0.26	0.02
ZN	5	4.48	0.97

Mapsheet: 094K10
Biogeoclimatic: SES-SF
Tectonic: RM

Site: Todagin Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	30.62	6.73
WEIGHT	5	387.00	400.45
MOISTURE	6	0.78	0.01
AL	4	5.21	2.17
AS	6	0.02	0.00
BA	4	0.21	0.01
BE	4	0.21	0.01
CA	4	67.53	32.30
CD	4	0.21	0.01
CU	4	84.51	50.71
FE	4	729.50	264.04
HG	1	0.05	.
MN	4	1.70	0.76
NI	4	1.05	0.06
P	4	3404.95	539.08
PB	6	0.22	0.01
ZN	4	29.00	3.05

Mapsheet: 104H12
Biogeoclimatic: SBS
Tectonic: IP

Site: Todagin Lake
Species: Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	28.22	2.41
WEIGHT	5	223.00	50.07
MOISTURE	5	0.80	0.03
AL	3	2.53	1.26
AS	5	0.02	0.00
BA	3	0.22	0.00
BE	3	0.22	0.00
CA	3	300.77	33.15
CD	3	0.22	0.00
CU	3	0.58	0.13
FE	3	10.21	5.92
HG	5	0.07	0.02
MN	3	0.22	0.00
NI	3	1.08	0.02
P	3	2755.93	172.04
PB	5	0.21	0.03
ZN	3	4.41	0.94

Site: Tumeka Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	3	46.83	4.19
WEIGHT	3	1341.67	212.62
MOISTURE	3	0.77	0.02
AL	3	1.43	0.15
AS	3	0.02	0.00
BA	3	0.23	0.02
BE	3	0.23	0.02
CA	3	50.12	16.45
CD	3	0.23	0.02
CU	3	32.84	21.29
FE	3	163.84	67.38
HG	0		
MN	3	1.35	0.36
NI	3	1.13	0.12
P	3	3081.27	345.77
PB	3	0.30	0.12
ZN	3	22.41	1.80

Mapsheet: 104H04
Biogeoclimatic: SBS
Tectonic: IP

Site: Tumeka Lake
Species:Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	4	45.75	4.05
WEIGHT	4	1250.00	252.49
MOISTURE	4	0.73	0.02
AL	4	3.19	2.21
AS	4	0.03	0.00
BA	4	0.27	0.02
BE	4	0.27	0.02
CA	4	200.05	135.12
CD	4	0.27	0.02
CU	4	0.39	0.13
FE	4	10.61	5.48
HG	3	0.10	0.05
MN	4	0.27	0.02
NI	4	1.33	0.12
P	4	2483.87	167.64
PB	4	0.33	0.11
ZN	4	3.97	0.12

Mapsheet: 104H04
Biogeoclimatic: SBS
Tectonic: IP

Site: Tuya Lake
Species: Arctic grayling
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	40.88	2.24
WEIGHT	5	785.00	125.75
MOISTURE	5	0.81	0.02
AL	5	0.73	0.27
AS	0		
BA	5	0.19	0.02
BE	5	0.19	0.02
CA	5	136.94	103.23
CD	5	0.19	0.02
CU	5	0.35	0.09
FE	5	6.39	0.93
HG	5	0.07	0.03
MN	5	0.19	0.02
NI	5	0.96	0.08
P	5	1786.32	134.77
PB	5	0.27	0.16
ZN	5	6.74	2.58

Mapsheet: 104O02
Biogeoclimatic: AT
Tectonic: OB

Site: Tuya Lake
Species:Arctic grayling
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	38.44	4.14
WEIGHT	5	651.00	190.74
MOISTURE	5	0.80	0.01
AL	5	0.40	0.02
AS	0		
BA	5	0.20	0.01
BE	5	0.20	0.01
CA	5	91.91	9.21
CD	5	0.20	0.01
CU	5	0.29	0.12
FE	5	4.12	2.30
HG	5	0.12	0.04
MN	5	0.20	0.01
NI	5	1.01	0.06
P	5	2002.04	65.91
PB	5	0.20	0.01
ZN	5	3.48	0.31

Site: Unnamed
Species: Arctic grayling
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	2	31.00	1.84
WEIGHT	2	262.50	53.03
MOISTURE	2	0.75	0.02
AL	2	1.68	1.27
AS	0		
BA	2	0.25	0.02
BE	2	0.25	0.02
CA	2	151.88	64.19
CD	2	0.25	0.02
CU	2	4.23	2.29
FE	2	61.93	9.71
HG	0		
MN	2	1.97	0.20
NI	2	1.37	0.28
P	2	3049.65	374.84
PB	2	0.51	0.39
ZN	2	28.53	2.34

Mapsheet: 094J14
Biogeoclimatic: BWBS
Tectonic: AP

Site: Unnamed
Species: Arctic grayling
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	2	31.00	1.84
WEIGHT	2	262.50	53.03
MOISTURE	2	0.82	0.02
AL	2	0.37	0.04
AS	0		
BA	2	0.19	0.02
BE	2	0.19	0.02
CA	2	329.75	9.28
CD	2	0.19	0.02
CU	2	0.75	0.34
FE	2	4.13	0.21
HG	2	0.05	0.00
MN	2	0.19	0.02
NI	2	0.93	0.10
P	2	1663.54	64.88
PB	2	0.19	0.02
ZN	2	7.36	0.01

Mapsheet: 094J14
Biogeoclimatic: BWBS
Tectonic: AP

Site: Woodcock Lake
Species: Rainbow trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	38.46	2.53
WEIGHT	5	587.00	109.29
MOISTURE	6	0.76	0.02
AL	6	0.66	0.31
AS	6	0.02	0.00
BA	6	0.24	0.02
BE	6	0.24	0.02
CA	6	47.16	6.93
CD	6	0.24	0.02
CU	6	28.26	17.37
FE	6	234.94	84.26
HG	1	0.05	.
MN	6	1.06	0.07
NI	6	1.18	0.11
P	6	2932.43	262.73
PB	6	0.27	0.08
ZN	6	25.26	2.41

Mapsheet: 093G12
Biogeoclimatic: CA-LP
Tectonic: IP

Site: Woodcock Lake
Species:Rainbow trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	38.46	2.53
WEIGHT	5	587.00	109.29
MOISTURE	5	0.78	0.02
AL	5	1.42	1.17
AS	5	0.02	0.00
BA	5	0.22	0.02
BE	5	0.22	0.02
CA	5	1623.40	2218.61
CD	5	0.22	0.02
CU	5	0.35	0.19
FE	5	12.36	12.92
HG	5	0.06	0.01
MN	5	0.30	0.18
NI	5	1.11	0.08
P	5	2965.56	716.51
PB	5	0.35	0.28
ZN	5	6.10	2.68

Site:. Wokkpash Lake
Species:. Dolly Varden char
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	32.36	3.15
WEIGHT	5	365.00	105.48
MOISTURE	6	0.78	0.01
AL	6	3.34	1.67
AS	6	0.02	0.00
BA	6	0.22	0.01
BE	6	0.22	0.01
CA	6	148.40	65.61
CD	6	0.22	0.01
CU	6	4.42	2.02
FE	6	239.06	59.75
HG	1	0.35	
MN	6	1.42	0.35
NI	6	1.09	0.06
P	6	3156.72	469.48
PB	6	0.26	0.09
ZN	6	26.91	3.77

Mapsheet: 094K07
Biogeoclimatic: SES-SF
Tectonic: RM

Site:Wokkpash Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	32.36	3.15
WEIGHT	5	365.00	105.48
MOISTURE	5	0.80	0.01
AL	5	1.72	1.09
AS	5	0.03	0.02
BA	5	0.27	0.17
BE	5	0.27	0.17
CA	5	504.41	211.65
CD	5	0.27	0.17
CU	5	0.39	0.14
FE	5	11.18	2.96
HG	5	0.28	0.08
MN	5	0.27	0.17
NI	5	1.36	0.66
P	5	2872.44	1081.78
PB	5	0.35	0.22
ZN	5	4.75	1.55

Mapsheet: 094K07
Biogeoclimatic: SES-SF
Tectonic: RM

Site: Wokkpash Lake
Species: Mountain whitefish
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	31.52	3.64
WEIGHT	5	399.00	99.40
MOISTURE	6	0.77	0.01
AL	6	2.82	2.35
AS	6	0.02	0.00
BA	6	0.27	0.09
BE	6	0.23	0.01
CA	6	112.43	72.18
CD	6	0.23	0.01
CU	6	1.71	0.37
FE	6	99.86	98.88
HG	1	0.12	
MN	6	1.79	0.47
NI	6	1.20	0.09
P	6	3555.88	343.76
PB	6	0.23	0.01
ZN	6	23.35	2.11

Site: Wokkpash Lake
Species: Mountain whitefish
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	31.52	3.64
WEIGHT	5	399.00	99.40
MOISTURE	5	0.76	0.03
AL	5	0.95	0.40
AS	5	0.02	0.00
BA	5	0.33	0.19
BE	5	0.24	0.03
CA	5	899.18	975.14
CD	5	0.24	0.03
CU	5	0.33	0.10
FE	5	6.39	1.89
HG	5	0.18	0.13
MN	5	0.33	0.19
NI	5	1.22	0.15
P	5	2715.08	446.12
PB	5	0.33	0.17
ZN	5	4.13	0.64

Site: Yakoun Lake
Species: Cutthroat trout
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	4	34.88	4.01
WEIGHT	4	408.75	112.80
MOISTURE	4	0.80	0.02
AL	4	6.19	9.16
AS	4	0.02	0.00
BA	4	0.25	0.08
BE	4	0.20	0.02
CA	4	54.81	14.65
CD	4	0.20	0.02
CU	4	20.81	14.70
FE	4	47.31	23.75
HG	4	0.42	0.14
MN	4	1.42	0.27
NI	4	1.05	0.07
P	4	2896.25	661.76
PB	4	0.20	0.02
ZN	4	17.40	11.50

Mapsheet: 103F08
Biogeoclimatic: CWH
Tectonic: IB

Site: Yakoun Lake
Species: Cutthroat trout
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	4	34.88	4.01
WEIGHT	4	408.75	112.80
MOISTURE	4	0.77	0.01
AL	4	0.45	0.03
AS	4	0.02	0.00
BA	4	0.23	0.01
BE	4	0.23	0.01
CA	4	186.53	64.66
CD	4	0.23	0.01
CU	4	0.23	0.01
FE	4	0.23	0.01
HG	2	0.35	0.08
MN	4	0.23	0.01
NI	4	1.13	0.06
P	4	2247.50	70.18
PB	2	0.23	0.01
ZN	4	2.70	0.34

Mapsheet: 103F08
Biogeoclimatic: CWH
Tectonic: IB

Site: Yakoun Lake
Species: Dolly Varden char
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	4	22.50	5.76
WEIGHT	4	146.25	96.30
MOISTURE	4	0.77	0.03
AL	4	2.91	1.91
AS	4	0.05	0.03
BA	4	0.52	0.35
BE	4	0.52	0.35
CA	4	53.83	9.83
CD	4	0.52	0.35
CU	4	39.48	50.19
FE	4	227.22	73.99
HG	0		
MN	4	2.62	1.41
NI	4	2.71	1.60
P	4	3290.00	439.91
PB	4	0.58	0.30
ZN	4	35.46	7.88

Site: Yakoun Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	4	22.50	5.76
WEIGHT	4	146.25	96.30
MOISTURE	4	0.79	0.00
AL	4	0.42	0.01
AS	4	0.02	0.00
BA	4	0.21	0.00
BE	4	0.21	0.00
CA	4	309.60	223.41
CD	4	0.21	0.00
CU	4	0.21	0.00
FE	4	1.41	1.57
HG	3	0.56	0.82
MN	4	0.43	0.31
NI	4	1.06	0.02
P	4	2068.25	258.94
PB	4	0.42	0.24
ZN	4	3.77	0.56

Site: Yakoun Lake
Species: Sockeye
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	41.50	7.43
WEIGHT	5	835.00	405.28
MOISTURE	6	0.79	0.02
AL	6	0.80	0.59
AS	6	0.03	0.01
BA	6	0.25	0.09
BE	6	0.25	0.09
CA	6	48.67	7.58
CD	6	0.75	0.33
CU	6	204.28	120.26
FE	6	122.09	57.98
HG	6	0.06	0.01
MN	6	1.35	0.47
NI	6	1.26	0.45
P	6	3047.53	461.16
PB	6	0.25	0.09
ZN	6	32.02	6.93

Site:.Yakoun Lake
Species: Sockeye
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	41.50	7.43
WEIGHT	5	835.00	405.28
MOISTURE	5	0.76	0.02
AL	5	0.49	0.04
AS	5	0.02	0.00
BA	5	0.24	0.02
BE	5	0.24	0.02
CA	5	353.88	546.05
CD	5	0.24	0.02
CU	5	0.24	0.02
FE	5	1.30	2.09
HG	4	0.05	0.00
MN	5	0.24	0.02
NI	5	1.21	0.10
P	5	2190.00	549.33
PB	4	0.30	0.13
ZN	5	2.67	0.45

Mapsheet: 103F08
Biogeoclimatic: CWH
Tectonic: IB

Site: Yehiniko Lake
Species: Dolly Varden char
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	2	26.05	9.97
WEIGHT	2	197.50	194.45
MOISTURE	2	0.75	0.03
AL	2	3.14	1.76
AS	2	0.03	0.00
BA	2	0.26	0.03
BE	2	0.26	0.03
CA	2	140.86	43.43
CD	2	0.26	0.03
CU	2	5.69	2.03
FE	2	289.17	85.01
HG	0		.
MN	2	1.98	1.46
NI	2	1.28	0.13
P	2	4051.00	1323.42
PB	2	0.39	0.22
ZN	2	34.81	1.17

Mapsheet: 104G11
Biogeoclimatic: SES-SF
Tectonic: IP

Site: Yehiniko Lake
Species: Dolly Varden char
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	2	26.05	9.97
WEIGHT	2	197.50	194.45
MOISTURE	2	0.79	0.02
AL	2	2.01	2.22
AS	2	0.02	0.00
BA	2	0.21	0.02
BE	2	0.21	0.02
CA	2	160.26	49.34
CD	2	0.21	0.02
CU	2	0.52	0.11
FE	2	8.20	1.91
HG	1	0.22	
MN	2	0.21	0.02
NI	2	1.05	0.08
P	2	2272.45	5.44
PB	2	0.21	0.02
ZN	2	4.23	1.20

Site: Yehiniko Lake
Species: Mountain whitefish
Tissue: Liver

Variable	N	Mean	Std Dev
LENGTH	5	26.28	3.89
WEIGHT	5	195.00	78.58
MOISTURE	6	0.76	0.03
AL	6	1.78	1.83
AS	6	0.02	0.00
BA	6	0.24	0.03
BE	6	0.24	0.03
CA	6	95.81	70.62
CD	6	0.24	0.03
CU	6	9.32	14.81
FE	6	107.47	91.71
HG	0		
MN	6	2.34	0.74
NI	6	1.21	0.17
P	6	3752.33	578.05
PB	6	0.42	0.30
ZN	6	25.76	7.75

Site: Yehiniko Lake
Species:Mountain whitefish
Tissue: Muscle

Variable	N	Mean	Std Dev
LENGTH	5	26.28	3.89
WEIGHT	5	195.00	78.58
MOISTURE	5	0.79	0.01
AL	5	1.78	2.58
AS	5	0.02	0.00
BA	5	0.21	0.01
BE	5	0.21	0.01
CA	5	364.76	192.96
CD	5	0.21	0.01
CU	5	0.42	0.22
FE	5	7.96	5.24
HG	0		
MN	5	0.33	0.18
NI	5	1.05	0.06
P	5	2177.41	155.08
PB	5	0.21	0.01
ZN	5	4.74	1.33

Mapsheet: 104G11
Biogeoclimatic: SES-SF
Tectonic: IP